

**PERCEPTION OF NURSING STUDENTS ON SIMULATION AS A
LEARNING STRATEGY AT NURSING TRAINING COLLEGES IN
NAIROBI COUNTY, KENYA**

BY

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**A Thesis Submitted to the School of Education, Department of Education
Psychology in Partial Fulfilment of the Requirements for the Award of
Masters Degree in Educational Psychology**

Moi University

2024

DECLARATION

Declaration by Candidate

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DEDICATION

This research thesis is specifically dedicated to my dear family, my Husband Dr. Ojiambo and children Collete, Vincent, Patty, Hillary and Raphael. Thank you for your inspiration.

ACKNOWLEDGEMENTS

“I would like to thank the almighty God for enabling me to come this far in my education and for his strength throughout this study period. May I also express my sincere gratitude to my supervisors Dr. Richard Okero, Dr. Festo Ndonye, Dr Mary Sambu for their immeasurable continued support, invaluable supervision, and advice throughout the study. Finally, I acknowledge my friends and classmates for any contribution financially or morally they made in helping me carry out this study. To the readers of this study, education is the most powerful weapon that you can use to change the world.”

ABSTRACT

“Simulation is a teaching and learning strategy used in nursing education for the preparation of nursing students for clinical practice. The study aimed to determine the perception of nursing students on simulation as a learning strategy at nursing training colleges in Nairobi County Kenya. The following specific objectives guided the study; to assess the perception of nursing students towards simulation program; to identify how the classification of simulation affects clinical experience; to determine the perception of nursing students toward clinical experience; and to identify the benefits of simulation to nursing students on simulation as a learning strategy at nursing training colleges in Nairobi County, Kenya. Perception and experiences regarding the adoption of simulation in nursing programs and their advantages in their learning process and learning environments are not exposed. The study was guided by the theory of experiential learning, postulated by Kolb (1984). The study adopted a descriptive exploratory design in a quantitative approach. The target Population for the study was 470 consisting of diploma nursing students training at medical colleges in Nairobi County. The stratified random sampling technique was used in this study and the sample size was 210 participants. The instruments were subjected to a reliability test. The pilot study also helped in validation of the instruments through amending unclear and obscure questions and discarding ineffective and non-functional questions. The study used questionnaires to collect primary data from sampled nursing students from four colleges offering nursing courses within Nairobi County. Data was analysed through descriptive (frequency, percentages, mean, and standard deviation) and inferential statistics (correlation coefficient, coefficient of determination, analysis of variance, and model coefficients). Pearson correlation coefficient was at a significant level of 0.01. SPSS software was used to compute analysis. The findings were that integration of simulation programs, classification simulation, clinical experience as well as benefits of simulation significantly influences simulation as a learning strategy for nursing students. The findings gave an R-Square of 0.868 with the standard error of estimate being 0.128. This implies that using the composite score, integration of simulation program, classification simulation, clinical experience as well as benefits of simulation significantly influences simulation as a learning strategy for nursing students. Results also provided a p-value = $0.000 < 0.05$. This further confirms that the predictors positively and significantly influence simulation as a learning strategy for nursing students. Furthermore, an increase in integration of simulation program, classification simulation, clinical experience as well as benefits of simulation by one unit led to an increase in simulation strategy by 0.502, 0.124, 0.081, and 0.236 units respectively with a p-value of < 0.05 for each variable. Students therefore embrace simulation for their learning purposes. The study concluded that the integration of simulation programs, classification of simulation, clinical experience as well as benefits of simulations significantly influences simulation as a learning strategy among nursing students. The study strongly recommends that nursing educators should make simulation an integral part of their teaching for nursing students as embracing an integral approach will improve students' learning approach, formulation of a policy framework on the classification of simulation approaches, learners should know the classifications and practice them effectively. Students should practice clinical skills so as to generate experience that would yield positive results, the nursing colleges should embrace simulation learning strategy as it has a lot of benefits to learners.”

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ABBREVIATIONS AND ACRONYMS

HPS	:	Human Patient Simulator
ICU	:	Intensive Care Unit
KMTC	:	Kenya Medical Training College
KRCHN	:	Kenya Registered Community Health Nurse
MET	:	Medical Education Technologies
NCK	:	Nursing Council of Kenya
NMC	:	Nursing and Midwifery Council
OSCE	:	Objective Structured Clinical Examination
SBCNE	:	Simulation Based Clinical Nursing Education
VR	:	Virtual Reality

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Simulation is a teaching and learning strategy used in nursing education for the preparation of nursing students for clinical practice. The aims of nursing education principally centre on nursing knowledge, and assisting learners acquire the necessary skills and attitudes associated with nursing practice to care for patients and families as they deal with and handle real-life situations. Simulation is an educational process that can replicate clinical practices in a safe environment. Implementing simulation enables students to practice their clinical and decision-making skills for some significant issues they may face in their daily work (Gohen, 2018).

Improving knowledge and skill development has been a crucial component of the learning process across a variety of simulations, from flight simulators to healthcare simulators. Simulation in its preliminary stages has been practical for decades in the form of physical models of anatomical parts of the human body. Simulation-based teaching in healthcare was first introduced in the ninth century by a French midwife, Madame du Cowdray, to better train and illustrate childbirth-related complications to midwives. Simulation has evolved to be exceptional and innovative learning and teaching, technology and teaching techniques have improved (Krishnan, Keloth & Ubedulla, 2017). The simulation methods allow students to freely make mistakes without harming patients; they learn at their own pace; and repeatedly practice their clinical skills until when they develop a sense of proficiency (Eyikara, et al., 2017).”

Simulation is a method that can be designed to reflect real-life conditions, and which provides the opportunity to work in contexts that are closer and more representative

of real settings. The protected environment and the sense of security enhance student's self-esteem and confidence, thus promoting learning. Nursing education seeks to provide nurses with the clinical competencies needed to function in the ever-changing healthcare settings. Clinical competence in nursing practice entails the use of knowledge understanding, and judgment, as well as the competencies of the exhibition of skills attitudes, and qualities in the delivery of safe patient care in specific situations. While practicing clinical skills, taking a health history increased confidence and communication skills .Simulation helped students learn both clinical and non-clinical skills (Anderea & Kotowski, 2017). To develop the clinical competence of nursing students, nursing education institutions (NEIs) have relied heavily on classroom teaching and skills-based training (demonstration and return demonstration) in skills laboratory, usually complemented by clinical placements (Aebersold, 2018; Salifu et al., 2019).”

Simulation-based education is an exceptional educational approach that provides appropriate learning opportunities for to students understand complex concepts. (Haukedal et al., 2018). Moreover, it allows mastery in clinical judgment, and decision-making abilities, and enhances critical thinking (Knoesel, 2017).To ensure patient safety, simulation has been widely trusted around the world as teaching technique, because it allows a student to practice the skills and apply the knowledge that they have acquired in real -life scenarios (Krishnan et al., 2017).Students can practice nursing skills and psychomotor, critical thinking, decision -making and bedside manner skills while in the simulation laboratory. In a controlled environment, they can relax, practice, and try new things without jeopardizing the health and safety of a patient (Koukorikos, 2021). The advantage of clinical simulation helps students to raise the levels of both their proficiency and self-confidence, which will enhance

productivity, performance, and even job satisfaction. The use of high-fidelity simulation in nursing education was found to be more effective than traditional clinical training. This improved the students' knowledge and skills hence reduced anxiety. (Dogru & Aydin, 2020). Many resources exist to help institutions and individual units in designing their curriculum and encourage formal evaluation of such programmes to iterate the education in most essential for an individual (Atallah & Coffman, 2020; de Melo et al., Lawson et al., 2020).”

Lessons from the impact of the recent Covid19 pandemic on clinical nursing education may lend credence to this assertion. The increasing students numbers in various parts of the world have resulted in overcrowding at clinical placements sites and sometimes makes it difficult to find placement sites suitable for the learning needs of students (Kim et al.,2016; Salifu *et al.*, 2019).Concerns have also been raised over the safety and the ethical implications associated with using real patients for clinical teaching and student learning, especially , as patient acuity among hospital inpatients is increasing because of shift from hospital to community care (American Association of colleges of Nursing, 2017; Amilia & Nirmala, 2020; Kpodo et al., 2016). Simulation in nursing education helps to address any limitations related to the clinical setting, promote team work and solidarity among students and implementation of a protocol for the attainment of a skill. In the clinical setting simulation aims to improve patient safety and to help the student nurse achieve competence, linking their theoretical knowledge with clinical practice (Rickets, 2011). Internationally simulation has been endorsed by nursing professional bodies such as National League for Nursing in the United States and Nursing Midwifery Council in the United Kingdom (Nursing and Midwifery Council, 2015).”

Nursing students perceive simulation as a good foundation phase. They feel that simulation sessions help them understand nursing care and interventions, prioritize care, relate theory to practice, and improve their knowledge and skills in a specific case. Nursing students who take part in simulation education programs perform fewer medical mistakes in clinical settings, and can better develop their critical thinking and practical skills. Simulation can foster the learning process of clinicians as it mimics clinical scenarios. Learning in a simulated environment addresses the learning needs of students in a controlled and non-threatening environment (Lamen & Dixon-Woods, 2020).”

Internationally, simulation has been endorsed by nursing professional bodies such as national league of nursing in the United States of America and nursing and midwifery council in the United Kingdom (Nursing & Midwifery Council, 2015). The Nursing Council of New Zealand has made it a requirement that all students have access to simulation learning resources to prepare them appropriately for clinical experiences to ensure the safety of health consumers, learners, and staff (NCNZ, 2010). In Lesotho, teaching and learning through simulation in nursing education has been used to prepare nursing students for clinical practice. The Ministry of Health developed and equipped simulation laboratories across Lesotho and redesigned curricula, trained faculty in clinical simulation scenarios and student debriefing methods, and developed a plan for sustaining simulation-based education. Livingstone and Patricia (2014) in their article Development of a Simulation Skills Centre in East Africa found out that Rwanda is another country that recognized the benefits of simulation-based education in healthcare. In Kenya, there are a few nursing schools that have developed simulation centres for training learners. Kijabe Mission Hospital through improving the perioperative and anaesthetic care training in Africa developed a

simulation centre to enhance the training of nurse anaesthetists through simulation. Kenya Medical Training College -Kitui campus was supported by Capacity Kenya to upgrade the skills laboratory by setting up teaching tools such as training simulators, mannequins, and other humanistic models to improve instructional methods and build skills for learners in family planning/ reproductive health (Kimeu&Oyucho2012).”

The use of simulation-based learning can help nursing students have more comprehensive learning experiences, which can lead to better patient care. Improvement of knowledge through simulation aids in improving clinical practice skills and thus contributes to more comprehensive learning experiences for the students (Khalil et al., 2023).Simulation helps students integrate new information with the existing knowledge, to explore the effectiveness of simulation on transfer of theories to practice in clinical settings and patient outcomes more research is needed (EI Hussein & Concannon, 2022). Despite achievements in training through the use of simulation, there is a need to determine the perception of nursing students on simulation as a learning strategy.”

1.1 Problem Statement

For the past 20 years, simulation has been integrated into nursing education program for the students at the nursing training colleges in Nairobi County, yet nursing student’s perception and experiences regarding the adoption of simulation in nursing programs and their advantages in their learning process and learning environments are not exposed.

Studying these views will help overcome strain students encounter in a real clinical situation. Consequently, the study findings would assist educators in improving the practice through integrating the simulation into the clinical training.

Little is known about the perception of nursing students on simulation as a learning strategy in Nairobi County, therefore it is necessary to have an informative study to appraise whether simulation adds value to the students' learning.

1.2 Purpose of the study

The purpose of this study was to determine the perception of nursing students on simulation as a learning strategy at nursing training colleges, Nairobi County with view of integrating the learning strategy.”

1.3 Objectives

1.3.1 Broad objective

To determine the perception of nursing students on simulation as a learning strategy at nursing training colleges, Nairobi County.

1.3.2 Specific objectives

- i. To assess the perception of nursing students towards the simulation program.
- ii. To identify how classification of simulation, affect clinical experience.
- iii. To determine the perception of nursing students towards clinical experience.
- iv. To identify the benefits of simulation on nursing students.

1.4 Research Questions

- i. How do nursing students perceive the simulation program?
- ii. How does classification of simulation affect nursing students' clinical experience?
- iii. What are the perceptions of nursing students towards clinical experience?
- iv. What are the benefits of simulation on nursing students?

1.5 Significance of the Study

The findings of this study may influence nursing students to have a positive influence on simulation as a learning strategy ,the students may embrace simulation for their learning purposes and that the nursing educators may make simulation as an integral part of their teaching for nursing students ,as embracing integral approach may improve students learning approach .formation of a policy framework on classification of simulation approaches that learners may know the classifications and practice them effectively. The students may practice clinical skills to generate experience that would yield positive results, and nursing colleges may embrace simulation learning strategy as it has a lot of benefits to learners.”

1.6 Operational Definition of Terms

Clinical self-efficacy-Personal beliefs by nursing students regarding the ability to successfully carry out clinical nursing tasks necessary to provide appropriate care for the patient in the clinical setting.

Debriefing –A time of reflective learning where learners evaluate their decisions and actions in a group setting and integrate the newly constructed knowledge.

Fidelity – refers how closely simulation replicates the selected domain and determines the number of elements that are replicated as well as the error between each element.

Human Patient Simulator-A kind of mannequin that consists of advanced and adjustable computer controls for providing various physiological parameter results of an electrical, physical, and combinational nature used by nursing students during simulation.

Learning strategy—self-generated thoughts, feelings, and actions, which are systematically oriented towards the attainment students’ goal. In this study, it is related to employing simulations as a learning strategy.

Perception –nursing students’ interpretation and understanding or experience on simulation.

Simulation – Activities that mimic reality that involve role-playing, interactive videos, or mannequins which help students learn and allow them to demonstrate decision making, critical thinking and other skills.

1.7 Theoretical Framework

A theory refers to a set of explanations that can provide help in understanding people’s behaviours and a framework from which an individual can explain and comprehend events (Philip & Pitman, 2013). Under theoretical framework a researcher considers theories and propositions that have been formulated about the problem by other studies in the problem area. A proposition is a theoretical statement that specifies the connection between two or more variables. If a particular theory is to be ascertained or tested it should be clearly explained under the theoretical framework. Theoretical framework shows how a study is related to the theoretical background. Research study should describe the theory clearly and show how the study will fit into the whole theory.”

Simulation is theoretically based on several learning theories. Hertel and Millis (2017) stated that simulation is rooted in experiential learning theory. The simulation places students at the centre of the learning experience and allows students to construct new knowledge and also gain knowledge from fellow learners’ experiences. In the design of the Nursing Simulation Framework, Jeffries and Rogers (2007)

utilized Kolb's experiential learning theory, Schon's theory on reflection, and constructivist learning theory. This section will review the literature as it relates to experiential learning theory, Schon's theory on reflection, and constructivist learning theory and Kolb's experiential learning theory."

Kolb (1984) wrote extensively regarding experiential learning. Kolb's theory of learning described learning as a holistic integrative perspective on learning that combines experience, perception, cognition, and behaviour. Experiential learning is the process of learning by doing. The students are able to connect theories and knowledge learned in the classroom to real world situations by engaging students on hands on experiences and reflection. Students learn through student rather than instructor -centred experiences, by doing, discovering, reflecting, and applying. Experiential learning experiences help to complete students' preparation for their chosen careers which reinforce course content and theory. Kolb's model of experiential learning was circular and revolved around four stages; concrete experience, reflective observation, abstract, conceptualization and active experimental. The circular nature of Kolb's model emphasized the continual process that occurs throughout experiential learning. Kolb's theory of experiential learning emphasized the importance of the reflective observation stage. This stage has been described as a stage where new knowledge is generated. In simulation, reflection occurs during the simulation and during the debriefing time."

Reflection. The process of reflection was described by Gibbs (1988) as being divided into six stages. The first stage consists of describing the learning experience. The second stage is where the learner examines his or her feelings during the experience. The third stage consists of the learner identifying the positive and negative aspects of

the experience. Stage four, or the analysis stage, allows the learners the opportunity to analyse the experience, drawing knowledge through analysis. Stage five involves learners identifying how they could have modified their actions to enhance the outcomes of the learning experience. The final stage, or stage six, consists of learners developing an action regarding how they would deal with the experience in the future.”

Dewey and Schon emphasized on the importance of the process of reflection about learning. Dewey viewed the world as a constantly changing environment where the learner generates new knowledge through interaction (Gutek, 2004). Dewey (1938) stated that new knowledge was constructed through the process of reflection on the interaction. Further, Dewey, believed that the process of reflection was an active learning process that leads to problem resolution (Mietti, 2000). Schon (1938) expanded on Dewey’s thought regarding reflection and differentiated between reflection during the experience and reflection on the experience. Additionally, Schon (1987) stated that the reflective experience was based on experiential learning principals. Reflection during the experience allows learners to apply theoretical knowledge in an interactive environment as they solve problems with appropriate coaching from a facilitator .The reflective learning environment also involves the process of reflection on the experience .Students utilizing reflection on the experience can view a clinical situation following resolution , paying particular attention to their decision-making process during clinical situation .It is during the reflection on the experience that students critique their decisions and determine if alternative decisions should have been considered. Both the process of reflection during the experience and the process of reflection on the experience may be built into simulation experiences. The reflection during reflection experience may be

broadened with coaching from a facilitator and the reflection on the experience may be accomplished through the process of debriefing (Sawyer et al., 2016).

The rationale for debriefing is derived from numerous educational theories including Kolb's experiential learning theory. Ericsson stated that the immediacy of debriefing and feedback was necessary to ensure performance improvement. The facilitator has been identified as a major figure in the debriefing process. Debriefing is considered vital to learning from simulation and for the transfer of learning so that it can be applied to other situations (Riviere, 2019). Lasater (2007) stated that the facilitator, during the debriefing period, guides the students as they examine the simulation, reflecting on what care was provided to the patient and what changes they would make in the future. It has been reported that during the debriefing period, which involves analysis of the simulation, new knowledge generation takes place (Parsons White, 2008; Seropian et al., 2004)."

The Nursing Education Simulation Framework. Jeffries (2007) designed the Nursing Education Simulation Framework, incorporating the learning theories of experiential learning, reflection, and constructivism. The Nursing Education simulation Framework visually depicts how this collaborative relationship between the educator and the students and further depicts how this collaborative relationship and the design characteristics of the simulation impact learning outcomes. The simulations are designed with specific objectives in mind. The fidelity utilized within the simulations must be appropriate for the objectives. The simulations are also designed to promote problem solving skills while providing support to the students. The debriefing period that concludes the simulation focuses on learning outcomes while making a direct connection to clinical practice."

Kolb's Cycle of Experiential Learning

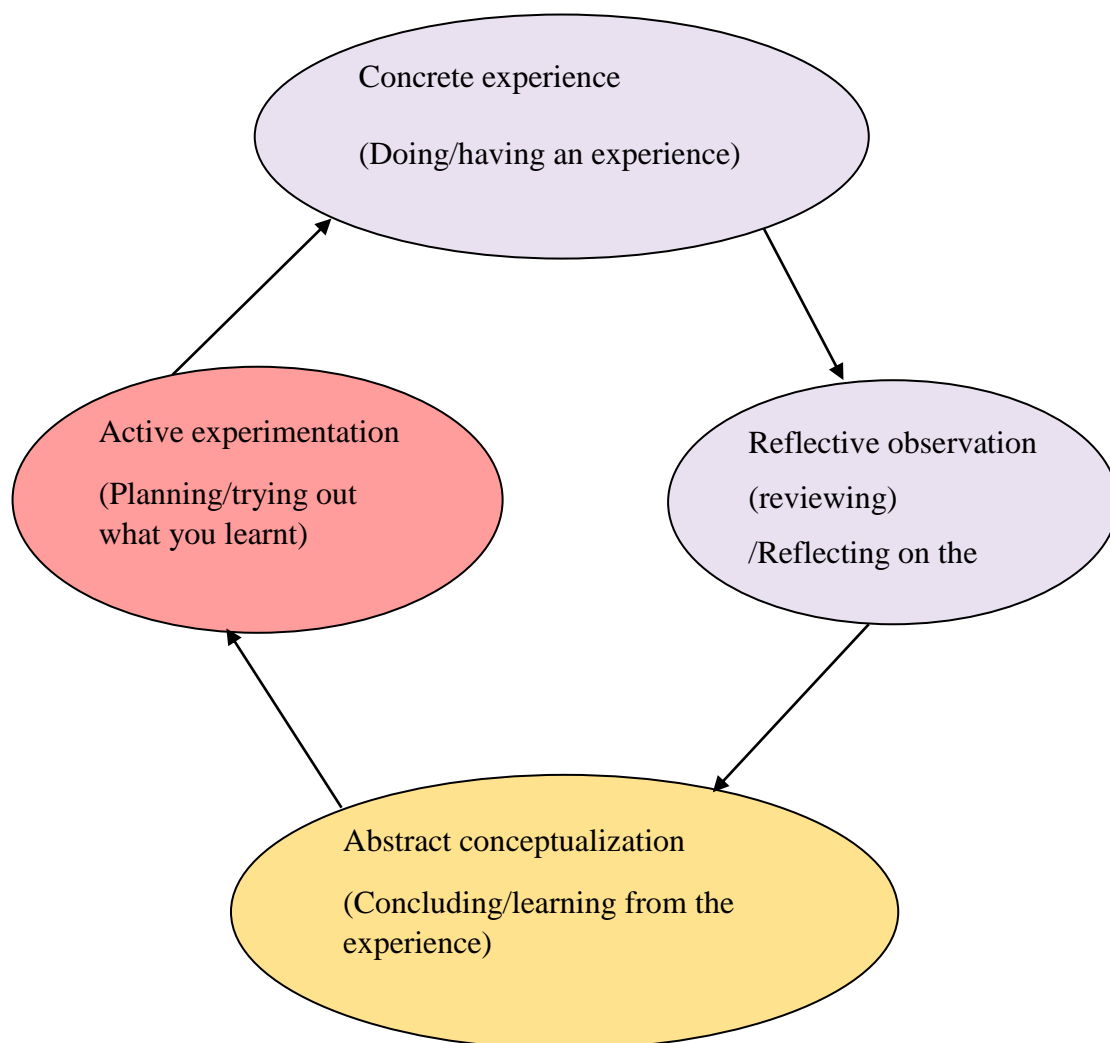


Figure 1.1. Kolb's learning cycle

Simulation is rooted in experiential learning theories. Simulation places students at the centre of the learning experience and allows them to construct new knowledge and also gain knowledge from their fellow learners' experience. Kolb viewed learning as an integral process with each of the four stages and an effective learning outcomes achieved when students progress through a cycle of the four stages. Experiential learning is the process of learning by doing. The students are able to connect theories and knowledge learned in the classroom to real world situations by engaging

students' hands on experiences and reflection. In simulation, reflection occurs during the simulation session and the debriefing time.

Abstract conceptualization: David Kolb is an American educational theorist who published his ideas about experiential learning in 1984. His four stages of learning are:

Concrete Experience: The cycle begins with the learner having a concrete experience. This means either learning something brand new or experiencing something familiar in a new way.

Reflective observation: The next stage of the cycle is about reflection after having a concrete experience, the learner should spend some time thinking about what happened, or watching others doing the same thing and reflecting on what's occurring.

Abstract Conceptualization: After the learner has reflected on their concrete experience, they make sense of their experience and reflections. They may think about their next steps for improving, come up with a plan of action, or confide in literature or an expert who can offer insight. This allows them to form new ideas, or modify existing abstract ideas so that they can act afterwards.

Active Experimentation: The final stage of Kolb's cycle is about acting on your previous reflections and thoughts, and this is known as active experimentation. The learner applies what they have learnt from the initial experience and sees if there are any modifications when they try the experience for a second time. This is essentially an opportunity to test new ideas.

The learner will have a new concrete experience as the cycle will start all over.

Experiential learning theory differs from cognitive as behavioural theories in that cognitive theories emphasize the role of mental processes while behavioural theories ignore the possible role of subjective experience in learning process. The experiential theory proposed by Kolb takes a more holistic approach and emphasizes how experiences including cognition, environmental factors, and emotions, influence the learning process. In the experiential model, Kolb describes two different ways of grasping experience: concrete experience and abstract conceptualization. He also identified two ways of transforming experience: reflective observation and active experimentation. According to Kolb, concrete experience provides information that serves as a basis for reflection. From these reflections, we assimilate the information and form abstract concepts.”

Effective learning is seen when a person progresses through a cycle of four stages (1) having a concrete experience followed by (2) observation of and reflection on that experience which leads to (3) the formation of abstract concept (analysis) and generalizations(conclusions) which are then (4) used to test hypothesis in future situations resulting in new experiences. The cycle begins with an experience that the student had, followed by an opportunity to reflect on that experience. The students may conceptualize and conclude what they experienced and observed leading to future actions in which students experiment with different behaviours. This begins the cycle a new as students have a new a new experience based on their experimentation. Kolb (1984) views learning as an integral process with each stage being mutually supportive of and feeding into the next. It is possible to enter the cycle at any stage and follow and follow it through logical sequence however, effective learning only occurs when a learner can execute all four stages of the model. Kolb’s learning theory (1984) provides support to simulation -based learning. According to Kolb, knowledge

is built by transforming experience in a recursive cycle among four adaptive learning modes: concrete experience (feeling), reflective observation (observing) abstract conceptualization (thinking) and active experimentation (doing). Through reflection, students assign a meaning to an experience, conceptualizing and incorporating it into their cognitive structure. This enhanced knowledge, when replicated in a new experience followed by another reflection, will produce new knowledge (Cummings & Connelly, 2016). Students not only learn from the experience, but also reflection on the experience, continuously expanding their knowledge (Kolb *et al.*, 2015). Simulation allows students allows to understand the experience through apprehension (Concrete experience) and comprehension (abstract conceptualization)and prepare themselves to transform the experience by intention(reflective observation) and extension(active experimentation).According to Kolb(1984),the complexity and integration of didactic conflicts between adaptive learning modes are divided into three key stages of development: acquisition(basic skills),specialization(ability to apply concepts to reality).”

1.7.1 Constructivism theory

The theory was originated by Jean Piaget 1896-1980.Constructivism include Vygotsky, Jean Piaget and John Dewey and Jerome Burnes. They believed that knowledge is constructed based on personal experiences and hypothesis of the environment. Learners continue to test this hypothesis of the environment through social negotiations. Constructivist is an approach to learning that upholds that people actively construct or make their knowledge and that reality is determined by the experiences of the learners (Elliot *et al.*2000:256). In elaborating Constructivist ideas Arends (1998) states that constructivism believes in personal construction of meaning by the learner through experience and that meaning is influenced by the interaction of

prior knowledge as new events. Learning is an active rather than a passive process. The passive viewing of the learners as an ‘empty vessel’, the learner is not a blank slate (tabula rasa) but brings experience and cultural factors to learning (Bhattacharjee, 2015).”

Constructivism believed that all knowledge is socially constructed and it is a social activity. It is something done together, interacting with each other rather than an abstract concept (Dewey, 1938). Thus, all teaching and learning is a matter of sharing and negotiating socially constituted knowledge (Vygotsky, 1978). In simulation the principles, believed that community plays a role in the process of making meaning, the environment in which children grow up will influence how they think about. Learning exist in the mind; the constructivism theory posts that knowledge can cv only exists within human man it does not have any real-world reality. As they perceive each new experience, learners will continually update their mental models to reflect the new information and will therefore construct their interpretation of reality.”

Based on Piaget’s constructivism theory, they learning is a constructive process, as it requires students to construct knowledge (Hmelo-Silver et al.2007) learning occurs when new knowledge is incorporated into the existing knowledge and when the teacher facilitates or guides this learning. In simulation the principles of constructivism are applied when learning is based on real-world cases, when it fosters reflection on the experience when students collaborate and when prior knowledge is integrated from the development of simulated practices (Jonassen, 1994).”

Vygotsky Social Constructivism theory suggests that development and learning are dynamic process that can occur simultaneously (Cato, 2013). There are three stages of skill development at any point of development (Berrangan, 2011): potential,

represented by what the student can perform with the help of others, proximal represented by the facilitator and actual represented by everything the students can perform independently. Social constructivism applies to simulation because learning can occur only through the interaction among students in the different scenarios they experience as a group (Cato, 2013) and in the presence of a teacher who encourages actual development (Wink & Putney, 2002).”

John Dewey was an American progressive educational psychologist and philosopher. He advocated for learner centred approach of teaching pedagogy. He is one of the most famous advocates of hands on learning or experiential education. He also advocated the teacher in the classroom should act as a facilitator and guide (Schweisfurth, 2013). Constructivist teaching is based on belief that learning occurs as learners are actively involved in a process of many and knowledge construction as applied to passively receiving information. Learners are makers of meaning and knowledge. Constructivism teaching fosters critical thinking and motivates independent learners (Bhattacharjee, 2015).”

1.8 Application of theories to this study

Kolb view learning as an integral process with each of the four stages and effective learning will be seen when students’ progress through a cycle of the four stages. At the concrete stage a nursing student has to learn a new procedure as part of their clinical education. Reflective/observation stage, the nursing student think about how they could have done the procedure better. At the abstract, the nursing student realizes they need to have all the materials ready before starting the procedure. At the Active experimental stage, the student might note how smoothly things go consistently when they have everything ready for a procure in advance.”

Constructivist theory is applied in this study by determining the perception of simulation as a learning strategy. The basic principles of constructivist are to provide a conceptual framework for strategies for learning. When new knowledge is incorporated into existing knowledge and when a teacher facilitates or guides this learning then that confirms that learning has taken place. Bandura's social cognitive theory suggests that people learn by observing others. The social cognitive theory can be used in class and clinical areas where students observe a nurse educator using simulation as a teaching strategy and students learning; they will remember sequence of events and imitate the behaviour the behaviour by retaining knowledge and improve on clinical practice.”

1.9 Conceptual Framework

This is a representation of the relationship the researcher expects to see between variables or the characteristics or properties that a researcher wants to study. The conceptual framework shows the interrelationship between the variables of the study and the main focus of the Kolb's theory of experiential learning, constructivist theory and Bandura social learning. Research may show the relationships schematically or diagrammatically researcher may after the study give a reduced model excluding the variables and the relationships which are not, supported by the research findings. In this conceptual framework perception of nursing students on simulation as a learning strategy, integration of simulation program, classification of simulation, clinical experience and benefits of simulation.”

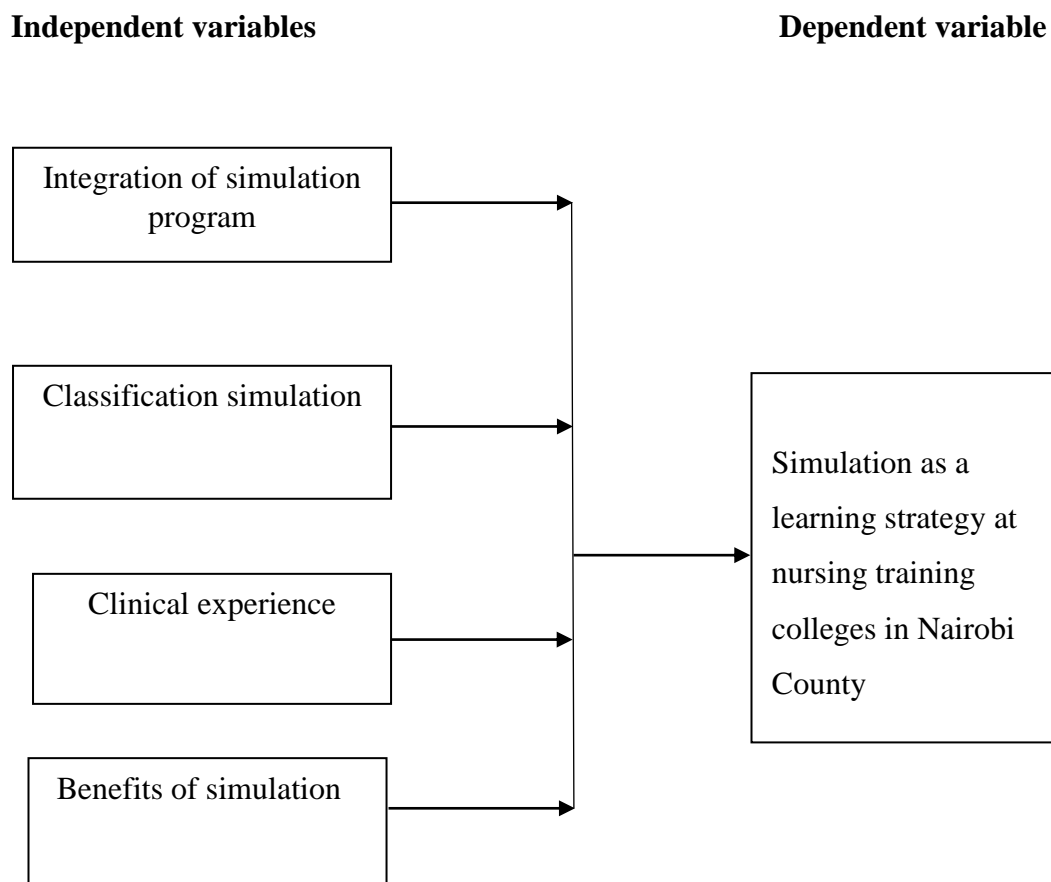


Figure 2.2 Conceptual framework

Source: Self-Actualization

1.10 Assumptions of the study

“All the respondents can interpret the research instruments properly and gave sincere responses. It was also assumed that the use of a simulation programme may improve students’ performance in real world. Tasks and practical experiences in skills lab are not meant to replace clinical experiences in the hospitals. The students embraced simulation for their learning purposes and the nursing educators made simulation as an integral part of their teaching for nursing students as embracing integral approach improved students’ approach.”

1.11 Limitations of the study

“Although we have other colleges offering registered nurse programmes out of Nairobi County, the study was confined to Nairobi County. Inferences from the findings were

therefore made only concerning nurse training colleges Nairobi County and generalization may not be possible to other colleges. The researcher however recommended similar research to extend to other colleges in other counties.”

1.12 Delimitations of the Study

“The study mainly focused on nursing training colleges in Nairobi county ,whereas the study anticipated a wide variety of perceptions of nursing students on simulation as a learning strategy, the study narrowed the focus to assessing the perception of Kenya Registered Community Health Nursing 1st, 2nd and 3rd year students towards simulation programme; identifying how classification of simulation affect clinical experience; determining the perception of nursing students towards clinical experience and identifying benefits of simulation on nursing students.”

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

“Healthcare educators are moving from the traditional methods of education, such as classrooms, to content and practices that are safe and risk-free. Simulation in healthcare can thus be described as a training approach where healthcare students are engaged in a reality-like simulated medical environment.”

“The following literature review is a collection of recent studies regarding simulation in healthcare education. This chapter is organized according to the following main topics: integration of simulation in health profession education, classification of simulation, effective clinical simulation, debriefing in simulation and benefits of simulation in nursing education.”

“The first topic covers the introduction of simulation uses in health education, with attention to the integration of simulation program in health profession education over the past decades. The second topic consists of how classification of simulation affects clinical experience. The third topic will cover the concept of perception of nursing students towards clinical experience and finally benefits of simulation in nursing education. Then the chapter will conclude with summation as well as a review of the importance of simulation in healthcare learning.”

2.1 Historical Background of Simulation

“Improving knowledge and skill development has been a crucial component of the learning process across a variety of simulations, from Flight simulators to healthcare simulators. Simulation in its preliminary stages have been practiced for decades in the form of physical models of anatomical parts of the human body. Simulation based

teaching in healthcare was first introduced in the ninth century by a French midwife, Madame du Cowdray, to better train and illustrate childbirth-related complications to midwives. Simulation in healthcare as science, technology, and teaching techniques have improved, simulation has evolved to be exceptional and innovative learning and teaching (Krishnan *et al.*, 2017). Simulation is derived from Latin word ‘simulare’ ‘which means’ to copy ‘, simulation is defined as the imitation of some real thing, state of affairs or process. Simulation has been divided into five categories; Electronic patients, Computer patients, Partial task trainers, Standardized patients and verbal patients. The educational strategy to achieve specific goals related to learning or evaluation in a safe and supportive environment is referred to as simulation -based learning (Salifu et al., 2019).”

2.1.1 Simulation in healthcare

“The field of healthcare simulation has made tremendous strides forward over the past several decades. One way this revolution is made possible is through clinical simulation research being conducted across the globe. The journal Clinical Simulation in Nursing is constantly sharing updates that include article research reviews, more information on standards of best practice, research briefs, and overall innovations in medical simulations. Simulation remains a powerful ally in developing clinical decision-making with its ability to foster experiential learning and provide a platform for reflection and reinforcement. It has been one of the preferred strategies for nurses and nursing students to immerse themselves in authentic care scenarios, refine their decision-making skills, and witness the consequences of their choices (Hall et al., 2017).

Simulation allows students to demonstrate competence and achievement of course objectives while experiencing a realistic clinical experience in a controlled

environment (Frankline & Blodgett, 2021). The positive outcomes of simulation in nursing education are improved critical thinking, patient safety, nursing skill mastery, communication, and clinical judgement (Hanshaw & Dickerson, 2020). Simulation provides immediate feedback and gives the health care professional a chance to compete the task using knowledge of errors or complications experienced during the first practice session. For healthcare trainees, simulation permits a unique learner-centred educational experience rather than a patient-centred experience in which the trainee, is attempting to acquire complex clinical skills.”

“Through simulation, nursing students may practice their abilities and clinical skills, make errors that will not be fatal for the patients, and repeat the process, leading to mastery. Simulation methods allow students to repeatedly practice their clinical skills until they develop a sense of proficiency; to learn at their own pace; and to freely make mistakes (Eyikara et al., 2017). Nursing simulation is a technique and not a technology. People unfamiliar with medical simulation often think that complex and sophisticated equipment is an essential component of simulation however, it is not the equipment but rather the educational methodology that is the key element and which allows students and qualified nurses to practice responding to various clinical situations and then reflect on how they performed, what went well and what needs to be changed.”

“Nursing simulation is being used not only in formal nursing education but also in medical facilities for ongoing training (e.g. Basic Life Support and Advance Cardiac Life Support), and to prepare nursing staff for clinical situations which occur rarely and for which, without regular practice, nurses may be unprepared (e.g. post-partum haemorrhage and paediatric critical events). Nursing simulation training is

particularly useful in situations that require a rapid response team involving so-called soft skills such as communication and team interactions (Aebersold, 2018).

“Simulation –based education has become popular among trainees in nursing (Happel, Lease, Nishikisaki & Braga, 2015). In a study to evaluate the impact of simulation education in paediatric care, Happel et al. (2015) found simulation provides an ideal platform for trainees to gain and maintain skill competence. The trainees acquire essential skills they can implement in critical events such as those found in emergency departments. The trainees reported improved performance, especially when handling critical events. The trainees reported they had an improved understanding of when to call for assistance. The trainees also reported a better understanding of medical management and an increase in confidence levels. The ICU is a critical department where patient safety and well-being must take priority.”

“Parikh, Brown, White, Market, Eustace, and Tchorz (2015) study showed that students appreciate the introduction of simulation. According to Parikh et al. (2015), simulation helped improved interpersonal and psychosocial competencies during end-of-life training. Students perceived simulation-based end-of-life care training as a valuable learning experience. The simulation, coupled with a formal Assessment of the learner’s communication skills and development of physician trust and empathy, helped encourage students at an early stage of their profession (Parikh et al., 2015).”

“The Nursing and Midwifery Council NMC (2018) reviewed to assess if nursing students are fit to practice at the point of registration. This was inspiring of the NMC (2017) survey simulation as a teaching and learning strategy has gained momentum (Prescott & Harside, 2017). Simulation assists a student by consolidating his or her skills and addresses skills deficits (Wilford & Doyce, 2019).”

“Billings and Halstead (2019) defined simulation as a near representation of an actual life event, may be presented using a computer, a role play, case study or games that represent realities and actively involve learners in applying the content of the lesson. Simulation is the promotion of understanding through doing (Billing & Halstead, 2019). In response to the concern raised by the review, the NMC implemented a simulation and practice project, which consulted on how best to ensure competence in practice and indicated the need to look more closely at how simulation could support the development of direct care skills needed for safe and effective nursing practice.”

“Traditionally simulation experience is reserved for courses with a clinical practice component rather than scaffolded across the curriculum (Aebersold, 2018). Without purposeful learning experiences, students struggle to implement theoretical knowledge into their clinical practice (Koukourikose et al., 2021). While simulation improves knowledge, confidence, and competence, most studies focused on clinical acquisition noting immediate near learning gains (Cant & Cooper, 2017). The utility of simulation in non-clinical nursing courses is less known. Siew, Wong, and Chan (2021) determined that simulation helped students learn both clinical and non-clinical skills related to geriatric care while standardized patients increased confidence and communication skills while taking a health history (Anderea & Kotowski, 2017). More research is needed to determine the effectiveness of simulation in other non-clinical practice.”

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innovations in medical simulations. This Healthy Simulation.com article by content manager Teresa Gore, Ph.D. DNP FAAN provides an overview of the latest clinical simulation highlights as of November 2023. And explains how these updates impact the healthcare simulation community (Gore, 2016). Simulation remains a powerful ally in developing clinical decision-making with its ability to foster experiential learning and provide a platform for reflection and reinforcement. It has been one of the preferred strategies for nurses and nursing students to immerse themselves in authentic care scenarios, refine their decision-making skills, and witness the consequences of their choices.”

Simulation allows students to demonstrate competence and achievement of course objectives while experiencing a realistic clinical experience in a controlled environment (Frankline & Blodgett, 2021). The positive outcomes of simulation in nursing education are improved critical thinking, patient safety, nursing skill mastery, communication, and clinical judgement (Hanshaw & Dickerson, 2020). Simulation provides immediate feedback and gives the health care professional a chance to compete the task using knowledge of errors or complications experienced during the first practice session. For healthcare trainees, simulation permits a unique learner-centred educational experience rather than a patient-centred experience in which the trainee, is attempting to acquire complex clinical skills.”

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sophisticated equipment is an essential component of simulation however, it is not the equipment but rather the educational methodology that is the key element and which allows students and qualified nurses to practice responding to various clinical situations and then reflect on how they performed, what went well and what needs to be changed (Campbell & Daley, 2017).

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to practice because it helps students integrate new information with existing knowledge, more research is needed to explore the impact of simulation on far transfer of theories to practice in clinical settings and patient outcomes (El Hussein & Concannon, 2022). Through simulations, nursing students may practice their abilities and clinical skills, make errors that may not be fatal for those under their care.”

2.1.2 Simulation in Nursing Education

“Nursing education seeks to provide nurses with clinical competence needed to function in the ever-changing health care setting. Clinical competence in nursing entails the use of knowledge , understanding ,and judgement as well as the competencies of the exhibition of skills , attitudes and qualities in the delivery of safe patient care in specific situations (Notarnicola et al.,2016;Park et al.,2013) .To develop clinical competence of nursing students ,nursing education has institutions have relied heavily on classroom teaching and skills-training (demonstration and return demonstration) in skills laboratories, usually complemented by clinical placements (Aebersold , 2018;Salifu et al. (2019) also found out that clinicians were dissatisfied with the level of knowledge and skills displayed by the students during clinical placements.”

“Furthermore, the lack of equipment and other learning resources within skills laboratory and nursing educational institution as a whole has been identified as a factor that continues to promote the over dependence on traditional, clinical educational strategies (Salifu et al.,2019; Salifu et al.,2022). Lessons from the impact of the recent Covid-19pandemic on clinical nursing education may lend credence to this assertion. The increasing students’ number in various parts of the world have resulted in overcrowding at clinical placements sites and sometimes makes it difficult to find placement sites suitable for the learning needs of students (Kim et al.,2016;

Salifu et al., 2019). Konstantinos et al., (2021) simulation constitutes a strategy for learning and understanding theoretical knowledge and skills in the nursing and medical field. The implementation allows students to practice their clinical and decision-making skills for significant issues they face in their in their daily work. The protected environment and the sense of security enhance student's self -esteem and confidence, thus promoting learning. In this way the gap between theory and practice is substantially reduced.”

“Simulation is a learning strategy where, following a certain scenario, students experience the actual dimensions of their future professional roles, which helps them to be more quickly integrated into the workforce of the healthcare sector. Implementing simulation enables students to practice their clinical and decision-making skills for some significant issues they may face in their daily work. Nursing educators involve a practice- oriented curriculum in which emphasis is placed on both theoretical knowledge and psychomotor skills. Simulation – based education and learning is an answer to the mainly theoretical training of students' to-date and helps them to develop knowledge, and skills while creating a sense of security both for the patient and the healthcare professional. This technique rebuilds a skill or clinical experience in full or in part, without exposing the patients to any risk whatsoever.

The technique is used to apply structured experiences (e.g. Venepuncture, patient resuscitation) based on a certain protocol and to enhance the team spirit and spirit of cooperation, mostly in countries with limited educational resources (Huges ,2018). This technique minimizes errors, increases the satisfaction of students from the educational process, and enhances their self-esteem, self-confidence, and comfort in skill performance. Aramification of introducing simulations into the curriculum must be considered. Nursing educators have examined the ramifications of incorporating

simulation experiences into the curriculum. The nursing educators, through the use of simulation experiences, can replicate the clinical environment. Although the use of simulation experiences is increasing in health care professional's curriculums, several challenges have been identified in the literature regarding the use of simulations. One of these identified challenges is the funding for the equipment necessary to run realistic simulations (Harlow & Sportsman, 2007; Haskvitz & Koop, 2004)."

"The objective of nursing education apart from the acquisition of solid theoretical knowledge, is the acquisition of clinical skills, which are necessary for graduate nurses to be promptly integrated into the workforce. Integrated learning, critical thinking, and optimal decision-making skills make help nurses to provide quality health care. This can be achieved through the inclusion of simulation in the education process. Along with other educational methods further development of simulation may be of great assistance in the attempt made by students to become integrated and successful healthcare professionals. Simulation has been used for educating health professionals and has evolved due to the demand to provide high-quality care, increased complexity of patients and need to minimize risks of care delivery for patients (Hall &Tori, 2017).

As patient acuity among hospital inpatients is increased because of shift from hospital to community care, concerns have also been raised over the safety and the ethical implications associated with using real patients for clinical teaching and student learning (American Association of Colleges of Nursing, 2017; Amila & Nurmalia, 2020; Kpodo et al., 2016). Students may develop clinical competence if exposed to clinical scenarios in the simulation laboratories before clinical placements (Jeffries, 2016; Mungatira et al., 2019). The international Nursing Association for clinical and learning (INACSL) has published best practice recommendations for the design and

implementation of SBCNE to promote its use standards committee (2016) include; Conducting needs assessment to ensure availability of resources to support the simulation experience; Structuring the simulation based on the overall purpose of the simulation experience, theory and simulation modality; Designing a scenario to reflect the simulation-based experience; Adopting a facilitative, participants and the simulation outcomes; Commencing the simulation experience with prebriefing that entails the establishment of participant expectations and setting the ground rules for the simulation experience; and ending the simulation session with debriefing and feedback aimed at enriching the learning experiences.

The participants increased satisfaction and self-confidence, the acquisition of knowledge, skills and attitude, as well as behavioural change (Aebersold, 2018; Cook et al., 2018; 2016; Kim et al., 2016). What is debated is how the SBCNE contributes to knowledge transfer and improvement in patient care and the health system (Cowper thwait, 2020; Jeffries. 2016). Studies that that linked SBCNE to better outcomes have been criticized for their lack of robustness and methodological validity (Kunstet et al., 2018).”

Nursing education involves a practice-oriented curriculum in which emphasis is placed on both theoretical knowledge and psychomotor skills. Implementing simulation enables students to practice their clinical and decision-making skills for some significant issues they may face in their daily work. The protected environment and the sense of security enhance students’ self -esteem and confidence, thus promoting learning (Eyikara, 2017). It is important to ensure the integration of theoretical knowledge into practice. Learning through practice occupies a central role in skilled –based education.”

“Simulation based nursing education is an increasingly popular pedagogical approach. Through various real-life situational experiences simulation allows students to practice their clinical and decision-making skills. Simulation in nursing education allows nursing students to practice their skills in a safe environment under supervision. They work with high tech manikins to perform typical nursing duties in a hospital setting before they apply those skills to clinical practice in the real world. Konstantinos et al., (2021) simulation constitutes a strategy for learning and understanding theoretical knowledge and skills in the nursing and medical field. Simulation is a learning strategy where following a certain scenario, students experience the actual dimensions of their future professional roles, which helps them to be more quickly integrated into the work force of the healthcare sector.”

“In nursing science, simulation is used for learning what was taught theoretical and clinical skills. This promotes the critical thinking skills of students. Simulation allows students work in an environment closely resembling that of a hospital and helps them to gain healthcare and nursing experiences even before they start working as professionals. The students practice what they have been taught in class, cope with any difficulties and even make mistakes without causing damage to the patient (Eyikara et al., 2017). Simulation is a method which can be designed to reflect real - life conditions, and which provides the opportunity to work in contexts that are closer and more representative or real settings. Nursing education seeks to provide nurses with clinical competencies needed to function in the ever-changing healthcare setting. Clinical competence in nursing entails the use of knowledge, understanding and judgement, as well as the competencies of the exhibition of skills, attitudes and qualities in the delivery of safe patient care in specific sector situations (Notarnicola et al., 2016; Park et al., 2013).To develop clinical competence of nursing students,

nursing education institutions (NEIs) have relied heavily on classroom teaching and skills and skills -based training(demonstration and return demonstration) in skills laboratories, usually complimented by clinical placements (Aebersold, 2018; Salifu et al., 2019). Salifu et al. (2019) also found that clinicians were dissatisfied with the level of knowledge and skills displayed by students during clinical placements. Furthermore, the lack of equipment and other learning resources within skills laboratory and NEIs as a whole has been identified as a factor that continues to promote the over dependence on traditional, clinical educational strategies (Salifu et al., 2019; Salifu et al., 2022).”

Lessons from the impact of the recent Covid-19 pandemic on clinical nursing education may lend credence to this assertion. Clinical placements sites are overcrowded due to increasing students’ number in various parts of the world, and sometimes makes it difficult to find placement sites suitable for the learning needs of students (Kim et al., 2016; Salifu et al., 2019).”

2.1.3 Effectiveness of simulation-based education

Simulation-based education is an exemptional educational approach that provides appropriate learning opportunities for students to understand complex concepts (Haukedal et al., 2018) Moreover, it allows mastery in clinical judgment, and decision-making abilities, and enhances critical thinking (Knoesel, 2017). Besides these non-technical skills like communication, leadership, and teamwork, they can be learned through simulation. Research studies have shown that, apart from individual and team learning, simulation tools provide an opportunity to test administrative performance and problem-solving skills.”

Another study was found in support of simulation, which was conducted by Karakoc and Bal in the emergency department to determine the impact and knowledge of implementing simulation scenarios on idle and service time (Karakoc et al., 2018). A randomized study was conducted by Keleekai and the college to improve clinical skills between two groups of nurses for the insertion of a peripheral intra venous catheter. The intervention group, which received a two-hour training, revealed an improvement in knowledge and skills, as compared to the wait list group. According to Parsh (2010), factors such as improvements in technology and shortage of clinical placement for learning students have pushed colleges to adopt the simulated clinical Experience SCE, which exposes nursing students to the reality of clinical environment where they can then demonstrate procedures and engage in decision making and critical thinking.

However, the effective use of SCE requires a qualified and experienced instructor. Parsh 2010 interviewed different nursing students regarding their opinions on what constitutes an effective an instructor. The nursing students mentioned that the instructor must have effective teaching abilities to guide students in the SCE as well as in an actual clinical setting. According to the nurse learners , the instructor must guide students through the simulation learning process without necessarily helping out and giving solutions to every problem students face (Parsh et al , 2010) .In other words, the instructor must be patient enough to allow students to evaluate the simulated scenario , engage in critical thinking , and make their own decisions during the simulated scenario .The nurse students also seek instructors who can provide an effective an effective evaluation of students Haraldseid, Friberg & Aase, 2015; Parsh, 2010). The instructors must give positive, direct and energetic responses and

demonstrate a genuine desire to see students excel during the simulation (Haraldseid et al., 2015; Parsh, 2010).”

2.2 Types of Simulation in Nursing Education

“These processes include, among others, plain demonstration of certain scenarios on a computer (cognitive test), simulation of a nursing skill, or carrying out of an integrated process. These types of simulation in nursing include; use of high-fidelity mannequins, low fidelity mannequins, partial task simulators, and standardized patients (volunteers playing roles of patients) The educational strategy to achieve specific goals related to learning or evaluation in a safe and supportive environment is referred to as simulation-based learning. Hybrid simulation can be developed with mannequins of any fidelity and tables for simulators with a standardized patient to create a complex, high -level learning activity. Alinier (2007) described six steps of simulation, known as technological simulation levels (0-5). The first type (level 0) employs written cases and patient information. This level is often used in classrooms and led by students. Level 0 is a written simulation (i.e., case studies) that includes patient information such as blood test results, x-rays, ECG printouts, and so on. In other words, level 0 does not require any particular equipment. Level 0 is a cost-effective type of simulation that can be used for a large number of students. However, this type of simulation provides unrealistic feedback.”

“The second type, level 1, is a three-dimensional model that focuses on the use of passive anatomical model’s learners can use for demonstration, practice of simple skills, and conduct of individual patient assessments. Level1 is often used in classrooms or clinical skills rooms and is led by students or a trainer. This level involves basic mannequins-based simulation, or low-fidelity simulation models. Moreover, level 1 can be used repeatedly to practice avoiding patient discomfort.

However, level 1 has a limited range of training functions and little or no interactivity (Alinier, 2007).

“The third type (level 2) involves the use of virtual reality (VR) and screen-based simulations. The screen-based simulations include simulation software, videos DVDs, VR and surgical simulators. Level 2 is often used in classrooms or multimedia/computer laboratories and is led by students or a trainer .Level 2 is typically used to help students to improve their cognitive and interpersonal skills .This level’s cost is relatively low, except VR simulations .Moreover, this type of simulation can be used for a large number of students and is considered a self – learning type of simulation. Furthermore, it can be used to provide feedback on performance. However, a level 2 provides unrealistic settings, and users of this type of simulation must be familiar with the software or the equipment.”

“The fourth type (level 3) involves the use of standardized simulated or real patients. Level 3 is used in clinical skills rooms or realistic simulation centre settings and is led by students or trainer. Level 3 is typically used to aid students in advancing their cognitive, interpersonal, physical assessment, and diagnostic skills. This type of simulation can be realistic, and it can be used to assess and provide feedback to students. However, level 3 should be used only for small groups of students, and patients have to be trained and briefed. Moreover, level 3 can be inconvenient for the students if the exercise repeated many times. Furthermore, this type of simulation is not valid for invasive procedures.”

“The fifth type (level 4) involves the use of full-body-size simulators, such as programmable mannequins, that are controlled by a computer. Level 4 is used in clinical skills rooms or realistic simulation centre settings such as a simulated theatre,

the intensive care unit (ICU), or ward, and it is preferably led by a trainer. The primary difference between levels 4 and 3 is that level 4 can be used for practicing invasive procedures. Level 4 is typically used as a full-scale simulation for training and demonstrations to assist students and to enhance their cognitive, interpersonal, physical assessment, diagnostic, and procedural skills. This type of simulation provides realistic experience that can be used to apply a broad range of skills. Moreover, it can be used for multi-professional training. However, level 4 requires several trainers for a relatively small group of students, and trainers must be familiar with the equipment. Furthermore, level 4 is a basic full-body-size simulator that is not fully interactive with the students. The sixth type (level 5), also known as a high-fidelity simulation platform, involves the use of interactive, full -body-size patient simulators (Koukrokos, 2021).

“Level 5 is the most advanced level of simulation, and it uses psychological features to imitate all the vital signs that can be monitored on a patient, such as body temperature, heart rate, and so on. Level 5 is used in realistic simulation level 4, but it can be fully centre settings, and it is preferably led by students. Level 5 has the same uses as interactive and is more advanced. Moreover, level 5 has the same advantages as level 4. However, level 5 is more expensive, and requires several trainers who must be familiar with the equipment. Furthermore, level 5 is used for a relatively small group of students, and it is not very portable (Gore, 2018).

“In the analysis of the use of simulators versus learning using traditional setting, nurse students gave equal importance to both platforms (Haraldseid et al., 2015; Raymond-Dufresne, Brazil, Johnson, Nielson, 2016). Simulation education prevents several issues that may occur with the use of the traditional clinical setting. For instance, in the clinical setting, the instructor may not be with the student at all times. The

instructor may walk students through a procedure just once and not repeat the process. In contrast, the use of simulations allows learners to learn a procedure and repeat it as many times as necessary, (Haraldseid et al., 2015). Additionally, student nurses argue that the traditional clinical setting provides other factors learners must consider. For instance, learners have to consider the patients, mental state, privacy, and the sensitivity of the situation (Raymond-Dufresne et al., 2016). In contrast, the use of simulators eliminates these factors unless it is a mandatory part of students' education. It is appreciated that both settings provide learners with a foundation where they acquire knowledge they can implement in the real world (Raymond-Dufresne et al., 2016). As the use of SBL increases in nursing education, the need to evaluate students appropriately, accurately, and in reliable ways intensifies in all domains of learning (e.g. Psychomotor, cognitive and affective domains) (Andretta Lori, 2014, Bensfield, Leach, & Horsley, 2012; Ricketts, 2011; Todd, Mainz, Hawkins, Parsons, & Hercinger, 2018)."

The use of high-fidelity simulation in nursing education was found to be more effective than traditional clinical training in terms of improving the students' knowledge and skills and reducing their anxiety (Dogru & Aydin, 2020)."

2.2.1 Limitations on the use of simulation in nursing education

"Simulation as a technique and holistic nursing care as philosophy constitute two different components of nursing courses that have been merged in the process of acquiring knowledge and skills required for patient care. Simulation provides an opportunity for acquiring knowledge and skills through the use of simulators, standardized patients and virtual settings. However, it is impossible to approach a patient as a whole, as a biopsychosocial human being Cohen et al., (2018). Not all variables related to an emergency in a live environment are included as IParikh,

Brown, White, Market, Eustace, and Tchorz (2015) study showed that students appreciate the introduction of simulation. According to Parikh et al. (2015), simulation helped improved interpersonal and psychosocial competencies during end-of-life training. Students perceived simulation-based end-of life care training as a valuable learning experience. The simulation, couple with formal Assessment of the learner's communication skills and development of physician trust and empathy, helped encourage students at an early stage of their profession (Parikh et al., 2015). Simulation training is carried out in a controlled setting managed by the educator who may stop and restart a process which is impossible in real life (Huges et al., 2018)."

"Incomplete training is another significant limitation that may appear in simulation. Due to time constraints, simulation fails to assess some essential parameters of the health care procedure and communication. Thus, the students fail to ask for, obtain the consent of the patient to the implementation of a medical procedure, or fail to follow basic rules of communication, which are necessary for establishing personal contact and creating a healing environment (Weller et al., 2012). The attitude of trainees is of great interest. The participants will always approach a simulator different from when they are in real life. There will be anxiety and concern, on the one hand, because one is aware that a certain event will occur and, on the other hand one may not pay attention because on one's life is in danger (Datta et al.,2012)."

2.2.2 Clinical Simulation

"Nursing education involves a practice-oriented curriculum in which emphasis is placed on both theoretical knowledge and psychomotor skills. Implementing simulation enables students to practice their clinical and decision-making skills for some significant issues they may face in their daily work. The protected environment and the sense of security enhance students' self-esteem and confidence, thus

promoting learning (Eyikara et al., 2017). It is important to ensure the integration of theoretical knowledge into practice. Learning through practice occupies a central role in skilled-based education.”

“Simulation-based nursing education is an increasingly popular pedagogical approach. It allows students to practice their clinical and decision-making skills through various real-life situational experiences. Simulation in nursing education allows nursing students to practice their skills in a safe environment under supervision. They work with high-tech manikins to perform typical nursing duties in a hospital setting before they apply those skills to clinical practice in the real world. Konstantinos et al., (2021) simulation constitutes a strategy for learning and understanding theoretical knowledge and skills in the nursing and medical field. Simulation is a learning strategy where following a certain scenario, students experience the actual dimensions of their future professional roles, which helps them to be more quickly integrated into the work force of the healthcare sector.”

“In nursing science, simulation is used for learning what was taught theoretical and clinical skills. This promotes the critical thinking skills of students. Simulation helps students work in an environment closely resembling that of a hospital and helps them to gain healthcare and nursing experiences even before they start working as professionals. The students can put what they have been taught, cope with any difficulties and even make mistakes without causing damage to the patients. Simulation is a method which can be designed to reflect real -life conditions, and which provides the opportunity to work in contexts that are closer and more representative or real settings. Nursing education seeks to provide nurses with clinical competencies needed to function in the ever-changing healthcare setting. Clinical competence in nursing entails the use of knowledge, understanding and judgement, as

well as the competencies of the exhibition of skills, attitudes and qualities in the delivery of safe patient care in specific sector situations (Notarnicola et al.,2016;Park et al.,2013).To develop clinical competence of nursing students , nursing education institutions (NEIs) have that heavily on classroom teaching and skills and skills - based training(demonstration and return demonstration) in skills laboratories, usually complimented by clinical placements (Aebersold, 2018; Salifu et al., 2019). Salifu et al. (2019) also found that clinicians were dissatisfied with the level of knowledge and skills displayed by students during clinical placements. Furthermore, the lack of equipment and other learning resources within skills laboratory and NEIs as a whole has been identified as a factor that continues to promote the over dependence on traditional, clinical educational strategies (Salifu et al., 2019; Salifu et al; 2022).”

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“A study done by Nyamu, Gatere, and Githinji (2018) on evaluation of utilization of simulation as a teaching and learning strategy at Kenya Medical Training College, Nairobi; the study found out that both the tutors and students had a positive perception towards the how simulation is utilized in teaching and learning as a strategy. The study indicated that simulation models at the KMTC were yet to be fully efficiently implemented in achieving all learning objectives .The coefficient of

determination square from the result showed that 29% of simulation as a teaching and learning strategy is discussed by perception on simulation, simulation models usage and of effectiveness of simulation of students .From the simulation model obtained , the simulation application had a coefficient of 0.469 , implying a relatively necessary method of teaching and learning strategy for students .The relationship was at 95% since the p-values are at less than 0.05.The study concluded that KMTC is yet to fully and successfully integrate the simulation method in their programs. The study recommended that the management to highly prioritize this during strategy formulations and budgetary allocation. They should also redesign the curricula, train the nurse tutors and sensitize the students on the importance of adoption of simulation methods (Nyamu, Gatere, & Githinji (2018).”

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has been identified as a factor that continues to promote the over-dependence on traditional, clinical educational strategies (Salifu et al., 2019; Salifu et al; 2022).”

“Lessons from the impact of the recent Covid-19 pandemic on clinical nursing education may lend credence to this assertion. The increasing student’s number in various parts of the world has resulted in overcrowding at clinical placement sites and sometimes makes it difficult to find placement sites suitable for the learning needs of students (Kim et al., 2016; Salifu et al., 2019). Concerns have also been raised over the safety and the ethical implications associated with using real patients for clinical teaching and student learning.”

2.2.3 Advantages of Clinical simulation learning in nursing

“Simulation has been widely trusted around the world as a teaching technique to ensure patient safety because it allows a student to practice skills and apply in real - life scenarios (Krishnan et al., 2017). Students can practice nursing skills and psychomotor, critical thinking, decision -making and bedside manner skills while in the simulation laboratory. In a controlled environment, they can relax, practice and try new things without jeopardizing the health and safety of a patient (Koukourikas, 2021). The advantage of clinical simulation helps students raise the levels of both their proficiency and self-confidence, and even job satisfaction.”

2.2.4 Disadvantages of clinical simulation

“Simulation provides students with a safe environment to practice skills as much as needed without harming patients. However, they can be costly, they replicate the clinical situation, and they can cause students to learn incorrect information if designed poorly. Simulation based may not accurately represent real -life making it difficult for learners to apply skills they have learned in the workplace. Simulation

often requires specialized technical experts in such areas as programming, graphic design, and animation. An organization that lacks this expertise may find it difficult to develop high-quality simulations that effectively engage learners. Some learners may have difficulty accessing simulation-based learning due to technical challenges.”

2.3 Effective Clinical Simulation

“To achieve an effective clinical simulation and hence a productive performance, the student should understand that the use of simulation is different from real-life clinical scenarios. Sometimes, the use of simulation can give students the impression they are fully qualified and prepared for real-life scenarios. According to Alinier (2007), overconfidence can lead to poor performance can then lead to a lack of motivation, a poor performance caused by misuse of simulation ambition, and confidence as a learner realizes that he or she lacks the experience to operate in a real medical environment.”

“According to Hogg and Miller (2016).The effective use of simulation improves performance and confidence, thus enhancing efforts to save patients’ lives and ensure their overall well-being. Learning institutions can adopt different simulation tools that ensure simulations are effective as a learning method (Hogg & Miller, 2016). The type of simulation and learning method that can be adopted depends on the students’ academic levels (Hogg & Miller, 2016). For instance, learners at a lower learning levels can learn with classroom teaching such as written cases (level 0).However as students advance, lessons must move to more advanced simulators to enhance the acquisition of clinical skills (Hogg et al., 2016). Simulation have been proven to provide learners with ideal ways to learn without putting patients’ lives at risk. According to Hogg and Miller (2016), the use of mannequins gives learners the chance to make errors and correct them before they finally attend a real –life patient.

Similarly, the use of simulators allows different students to perform the same medical scenario. Trainers have the opportunity to manipulate the parameters of the scenario and thus expose learners to different behaviours and outcomes (Hogg & Miller, 2016).”

“Simulation has also been utilized to assist students in the development of clinical judgement. Lasater (2007), conducted a qualitative study utilizing focus groups following the simulation experience. The simulation experiences consisted of complex medical-surgical patient care scenarios. Laster reported that during the focus groups several themes emerged. Students felt that the scenarios required them to reflect on what they had learned and apply that knowledge to the patient care scenarios. Students stated that they felt anxious, but that they felt the anxiety heightened their awareness of the situation, allowing them to learn from both their correct actions and mistakes.l

“Simulations have also been utilized to promote effective functioning of interdisciplinary health care teams. A group of Norwegian researchers, Wisborg, Brattleboro, Barito, and Brinchmann-Hasan (2006) designed a simulation to assist trauma teams to function effectively during a trauma event. One of the main reasons for designing a simulation with this type of scenario was that Norwegian hospitals frequently receive trauma patients. A questionnaire was administered to the teams before and after the training. The questionnaire consisted of a self-reporting evaluation of whether or not educational expectations were met and the learners’ perception of learning that took place. Participants who participated in the study.”

2.3.1 Benefits of simulation-based education

“Simulation based learning is one of the main components of healthcare education and is widely accepted by the teaching community as a method to expedite skills training and assessment. Simulation assessments can also provide learners with immediate feedback, which can help them identify areas for improvement and guide their learning, collaborating the ideas presented by several internationally published studies. To accomplish most of the simulations, educators find creative ways to integrate simulations to create an engaging and immersive learning environment. The purpose of applying these strategies is intended to ensure success for both faculty and students also stipulated (Aebersold et al., 2020).”

“Simulation based education and learning becomes interactive and experiential, the main benefit being the consolidation of skills acquired and knowledge taught. The setting where the simulation is performed promotes learning and, through repetition of a skill, this skill becomes fully understood and clear. Wellard et al. (2021) report that the protected setting of a laboratory practically drives students to learn and understand certain skills while Freeth et al., (2022) argue that clinical laboratories and simulation substantially reduce student anxiety and fear.”

“Simulation helps to address any limitations related to the clinical setting, promote teamwork and solidarity among students, and implementation of a protocol for the attainment of a skill. It is based on scenario where learning becomes interactive, allows feedback between the educators and the other members of the team, and promotes clinicians reasoning and critical thinking in the team. According to Cook et al., (2018) health care systems are reinforced by simulation because there is an interprofessional development of the team of the healthcare professional, an overall improvement in the performance of activities and healthcare skills, and an

enhancement of the competence of health care professionals in a safe setting. Simulation, as an evidence -based educational technique and process, firstly appeared when it became difficult for nurses working in a hospital to acquire clinical experiences.”

2.3.2 The future of simulation in nursing education

“The use of simulation as an educational strategy represents a great challenge for nursing education. Simulation may improve healthcare and patient safety. No patient who is alive is put at risk at the expense of the trainee. Simulation provides standardization of cases, promotes critical thinking, allows supervision of patient care, provides immediate feedback, and helps students to assimilate knowledge and experience.”

“Nursing Science and art constitutes a highly significant and integral part of the health care system. Nurses and their training are fundamental elements of the effectiveness of the system; therefore, special attention is paid and must be paid. (Aebersold, 2016).”

2.4 Other strategies Used in Teaching in Nursing Education

“Nurse Educators are involved in teaching nurses in training the best patient care practices and important healthcare concepts in diagnosis, management of illness and administration of drugs. Be it in the classroom or clinical areas, there are many different strategies for teaching nursing students. Major academic institutions including the ache the Carnegie Foundation have advocated for changes in how nursing students are educated to address the realities of 21st century healthcare.”

“Active learning strategies in nursing education is all about empowering students to remember the large amount of information they face throughout their training. Many

nursing students achieve success in their program by memorizing terms and concepts long enough to spit them back on a test. A concept curriculum helps students connect the dots to build critical thinking skills, rather than overwhelming students.”

“With vast amounts of repetitive content. Concept based learning challenges students to think more critically about new subjects and situations they encounter by applying prior knowledge and experience. To connect factual knowledge to ideas of conceptual significance and find relevance, students must think beyond the facts. For the student nurses to efficiently deliver in increasing amounts of instructional content, and to help them develop the critical thinking skills they need to succeed as nurses, the nursing leaders are recognizing the merits of a concept-based curriculum to accommodate diverse learning styles.”

“Before the Covid-19 pandemic, changes in nursing education were already underway. The pandemic accelerated the transformation. For example, programs suddenly had to explore nursing teaching strategies centred on virtual learning. Another trend influencing nurse educators ‘teaching strategies is the growing adoption of innovative technologies. Technology integration in education is also essential for creating a dynamic learning environment that foster critical thinking, clinical skills, and compassionate care.”

“Teaching strategies that actively involves students in their learning and even put them in situations where they can teach others can greatly improve student’s ability to retain important nursing concepts. Some strategies promote independent learning which can improve students' critical thinking and decision-making abilities. Nurse educators are integrated into helping, to ensure that nurses are well prepared for the future of nursing. The National Academy of Sciences (NAS) cites a rising interest in

health equity, enhancing population health, and meeting the needs of a diverse and aging population. The field of nursing is undergoing a transformative change to meet the evolving demands of health care delivery.”

“Teaching strategies for nurses are evolving to embrace diverse approaches and accommodate different learning styles that can enhance student engagement. These teaching strategies include competency-based learning, simulation based training, and virtual learning spurred on by the Covid-19 pandemic 27 July2023. Nurse educators greatly impact the future of nursing and health care through hands -on instruction in clinical setting. They keep abreast with the latest nursing practice standards with resources from organizations like the American Nurses Association (ANA). An understanding of nursing practice standards prepares nurses to deliver high quality care. Nurse Educators are responsible for teaching nursing standards.”

“Some teaching strategies involve putting students in groups which allows students to interact with and learn from one another, this happens from the stronger student relationship. Teaching strategies that promote interaction during class provide student chances to build soft skills, like communicating, critical thinking skills and collaboration that can make them more effective nurses. Some students are visual learners who prefer to observe and get information from watching, while others prefer to learn by doing. How students retain information and stay focused during lessons depends on how they best learn.”

“There are various benefits of various teaching strategies for nurses. When nursing students are challenged and provided information in different ways they may be likely to pay attention and participate during class activities that result from improved student engagement. Various teaching strategies enhance clinical skills, new

approaches to teach students patient care skills, which can improve how quickly they learn techniques and apply clinical concepts in real-world scenarios.”

“A concept-based curriculum provides the structured frame work to help create the learning outcomes, the instructional delivery and lesson objectives, and the student assessments. A concept-based curriculum in nursing education involves examining Concepts that link to the delivery of patient care. There are quite many potential benefits; helps students take a more role in their learning using the classroom model of instruction. Students apply concepts from one situation to another to make connections between those concepts. Students develop higher level of retention as they are encouraged to see patterns across concepts and use those patterns to deliver care.”

2.4.1 Lecturing

“Lecture method is the teaching procedure comprising the presentation of content, classification of doubts and explanation of facts, principles and relationships. Types of lectures includes; traditional oral essay, the teacher is an orator and the only speaker. Participatory lecture begins with learners brainstorming ideas. Feedback lecture consists with mini lecture with ten-minute small group discussion.”

“Giving a lecture involves outlining lessons, creating a presentation and rectifying information to students. This is a standard teaching strategy for many instructors, and in nursing this strategy can be helpful in courses that teach basic clinical concepts and applications of biology, chemistry and anatomy in nursing. Using attractive and organized presentations and allowing students to ask questions throughout can maintain student engagement. Lecturing is believed to be a time –efficient, cost-effective way to present large amounts of new information to groups of students.

Students find this method of learning fun when presentation techniques such as videos are utilized. Sometimes this method of teaching is considered passive or boring. The teacher should avoid reading sentences verbatim for too long. Generally, learners remember only 20%-30% of what has been taught by hearing (Can't & Cooper, 2010). The lecture method is economical in terms of student time. A great deal of information can be communicated in one-hour lecture. Lecture method is the oldest teaching method given by philosophy of idealism.”

2.4.2 Mid-lecture quizzing

“If the trainer chooses the lecture approach, more interactive elements can also be included, like quiz questions throughout the presentation or lecture with quiz applications on a smart phone. Create a lecture based-quiz, incorporate the questions throughout the lecture or at the end and have students submit their responses as questions arise (Delaram & Gandomani, 2017). Weekly quiz tests increase test score for students.

2.4.3 Clickers

“Clickers are small technological devices, like a remote, that students can use to submit responses as questions arise during a lecture. The lecturer inserts quiz questions and has students use clickers to provide their answers anonymously, which removes the potential fear of judgement for answering incorrectly. The lecturer can reveal the answer and the overall response results, which shows students how well they have done and provides information on whether the students are understanding the lecture.TT

2.4.3.1 Concept mapping

“This learning strategy helps student nurses note the ways that different ideas interlink. Concept maps can help students acknowledge their current understanding and form new ideas. Concept maps helps learners to organize or process their knowledge logically. It is suggested that this visual learning techniques promotes critical thinking, analysis and evaluation. Learners also develop an understanding of their knowledge gaps and future learning needs (Norman, 2012).”

2.4.4 Case study

“The teacher provides a case scenario to make learners apply knowledge gained or learn new knowledge. The case may be discussed in the group during training or given as an assignment to be completed later. A case study in nursing is a review of a patient’s condition, medical history, diagnoses and treatment over some time. Reviewing case studies in the classroom can help nurses -in -training contextualize theoretical nursing practices in a real – world situation. A nurse educator, can discuss the case study with students in class and have them talk about the effectiveness of treatments or other decisions from the healthcare team. Every case study presented should be discussed with learners to provide gainful learning experience. The case study aims to close the gap between theory and practice, and improve action-planning and critical thinking (Rickets, 2011).”

2.4.5 Brain storming

“Brain storming encourages learners share their experiences and opinions. In this method the teacher poses a challenge to the learners to respond. Brain storming sessions allow participants to give each other active listening and constructive feedback in a relaxed atmosphere. Brain storming is meant to give “intellectual

thunder and lightning” (Rickets, 2011). Facilitators may use the brainstorming approach to identify a wide range of ways of solving the problem. This method calls upon the learners’ prior experience and it can encourage the reinforcement of the learning through practical application. Brain storming is designed to think creatively as a team. Ideas are spontaneously generated by group interaction in a setting that actively encourages creativity. No ideas are rejected. Random words can be introduced in the brain storming session to trigger other ideas. The goal of brain storming is to generate many ideas quickly and out-of-the box thinking can be encouraged. The ideas are then discussed, merged, and refined. The group eventually works to achieve a consensus on the final list or best approach to solve the problem. Group brainstorming has benefits to include; it provides multiple perspectives to use and helps about disagreements are sure to raise, some people are less enthusiastic than others about the opportunity to participate. Dominant personalities hinder the creative process by intimidating other team members or making them feel reluctant to share dissenting opinions.”

2.4.6 Demonstration

“This method is effective for skill transfer to the learners. The teacher demonstrates some of the concepts before asking the learners to do the same. Relevant examples should be cited during demonstrations. Learners should be given clear instructions regarding the demonstration (Norman, 2012).”

2.4.7 Role play

“Role plays are important in nursing education as they facilitate the practice of communication and conflict management. Role playing activities have students play characters in scenarios based on real-world healthcare situations, like patient-nurse

interactions. Students playing nurses apply patient care concepts learned in their course and other students observe and provide feedback. Role play should be brief to avoid boredom and loss of focus. The teacher should seek consent before pairing up the learners. This can be a great teaching strategy to build patient -focused interpersonal communication, quick problem-solving and decision-making skills. It is important to debrief following role-playing to offer support and reflection, as well as further learning (Norman, 2012).””

2.4.8 Excursions

“These involve trips to places relevant to learning e.g. hospitals, rehabilitation centres for drug abuse, counselling centres. Excursions enable learners to see the reality on the ground and the application of the knowledge gained. Excursions can be expensive and time consuming (Rickets, 2011).”

2.4.9 Reflective exercises

“Many nursing courses require students to complete reflective essays and reviews evaluating themselves after clinical training. Reflective exercises can also be incorporated throughout a course, such as after completing projects or in class exercises (Johns & Freshwater, 2018).

2.4.10 Question and answer method

“An effective teacher asks learners questions time to time. This method encourages creativity, active participation and good rapport between the teacher and the learners. Question method helps the teacher keep track of whether the objectives are being Achieved, or not. The learners also feel involved and own the learning process. In questions and answer method the teacher should discourage chorus responses. Avoid asking too many questions in a row. This method stimulates thinking in the learners

and helps the teacher to tap the potential of the learners and also gives the teacher a chance to give feedback and positive reinforcement to the participants (Norman, 2012).”

2.4.11 Videos

The subject matter and tutorial videos are on online video platforms that can be used in classroom settings, like during a lecture or and supplemental materials in an online course. These videos, produced by trustworthy institutions can provide a new take on concepts, show case characters or different from their teachers and use unique features and graphics to enhance viewing. The use of videos enhances the quality of clinical skills education (Forbes et al, 2016).

2.4.12 Information Education Communication

“This method involves use of pictures, puppets, posters, video, pamphlets, power point projection. I.E.C is best for a large group and for passing information that words may not easily explain e.g. use of condoms and breast-feeding methods. IEC may not be relevant to groups without common goals or prior knowledge on the subject (Can’t& Cooper, 2010).”

2.4.13 Debate

“This teaching strategy involves providing students a prompt such as a controversial topic in nursing or healthcare or a current trend in the nursing field, and having them share their thoughts on it. Debating encourages active participation with the material and with fellow students develop skills in critical thinking, public speaking and argumentation.”

2.4.14 On line course

“Many instructors use online courses to allow students to work through course materials at their own pace. The trainer might include forums and discussion boards for students to answer prompt and respond to each other’s answers, additional readings like journal article promotes independence and time management as this self-paced learning approach put students in control of when to complete their work. It also allows students to complete work when they are best able to focus on the content.”

2.4.15 Peer Assessment

“This strategy allows student to practice critical thinking skills and giving constructive feedback. Peer assessment involves students grading each other in a variety of situations, such as after individual presentations, group projects or essays. It also promotes student -to-student teaching since they share their knowledge and perspective with students they grade and can review their assignment considering feedback they got from peers (Fertelli, 2019).”⁹

2.4.16 Jigsaw

“Jigsaw technique involves splitting students into groups and dividing their projects into separate parts, such as individual topic. Each student in the group chooses which topic and part of the project they want to complete. They complete the research, writing or other tasks in their position and they share what they learned with the rest of the group. Finally, they compile each part together into a cohesive project. This strategy creates a learning environment that relies on students completing independent work, which promotes values like dependability, time management and

cooperation, which are vital soft skills for nurses. It also has students teaching their classmates, encouraging to help everyone develop into effective nurses.”

2.4.17 Story telling

“Story telling involves creating real-world characters and situations that nursing students may encounter in clinical training or on the job. One technique a trainer can use is to create visual community, with families and healthcare workers as characters that students can follow throughout a course. Students can form connections to the characters and become invested in the stories of families dealing with healthcare situations and healthcare teams working together to solve them. This emotional investment can make students better pay attention to the choices the healthcare workers make and even recall those stories during exams or clinical training.”

2.5 Simulation and Learner Satisfaction

“Educators want the educational experiences provided for the students to be significant learning experiences where the learners are actively engaged in satisfying learning experiences. Chickering and Gamson (1987) in their writings regarding the seven principles of good practice in undergraduate education, stated that students who had satisfying learning experiences performed at a higher level. Several studies have been conducted utilizing participants from various education levels. Seropian et al. (2004) stated that when comparing the different types of simulation experiences from low-fidelity, students prefer utilizing high-fidelity simulations to complement their learning experiences.”

“Bremner, Aduddell, Bennet, and VanGeest, (2006) conducted a mixed methods study that examined novice students, perceptions of the value of high-fidelity simulation experiences. Students were asked about the teaching / utility, the reality , realism ,

any limitations and the students confidence/comfort level .The study found out that 61% of the students believed the experience helped them gain confidence in their physical assessment skills and 42% believed that the simulation experience helped to reduce the stress that comes with the first day of clinical .The qualitative data relieved that the simulation experience helped students identify areas of remediation that were needed.”

“Fink (2013), emphasized that the importance of learners being actively engaged in satisfying significant learning experiences. Fink stated that the results of significant learning experiences include preparing students for the realities of the world. Fink also emphasized the importance of students developing the desire to become life-long learners through actively taking charge of their learning. The research reviewed indicated that learner satisfaction was an important concept to consider when creating and evaluating learning experiences. When students participate in satisfying learning experiences, they may put up more effort into learning and persist longer when the learning environment is challenging. Satisfying learning experiences, where students are actively engaged in their learning may assist in increasing students, self-efficacy.”

2.6 Debriefing in Nursing education

“Simulation debriefing is often used in the bachelors or undergraduate levels of nursing to develop deep learning through enhancing critical thinking skills and self-efficiency among nursing students (Hall&Tori,2017: Fey,2014: Levet-Jones&Lapkin,2014). Post simulation debriefing is one the most effective components of simulation-based education. Debriefing which is an analysis of an event that allows learners to reflect on their experience and make meaning of it, is a frequently used tool in medical simulation as self-directed reflection may be unsystematic or absent. Many definitions of simulation debriefing exist (Fanning &

Gaba, 2007; Sawyer, 2016; Grant, 2018). Simulation debriefing can be as, learning conversations between two or more people occurring during or after a simulated event that involves reflection on performance, identification of performance gaps, exploration of the rationale for behaviours, and seeking solutions. A distinction can be made between debriefing and feedback in clinical education, although the boundaries are not well demarcated (Voyes&Hatala,2015).In the context of simulation, feedback is viewed as one-way delivery of performance information to simulation participants by a facilitator with the intent to improve future performance(Sawyer et al,2016).This is more specifically termed “directive feedback “which is preferable as other, broader conceptions of feedback view a two-way dialogue as important for its effectiveness.”

2.6.1 Debriefing and educational theories

“The rational for debriefing is derived from numerous educational theories including; Kolb’s experiential learning theory, the cycle of learning involves concrete experience reflection, conceptualisation, and active experimentation. Schon’s reflective practice is reflection in-action and reflection -on action aids learning. Have and Wenger’s situated learning theory is whereby learning is contextual, may be unplanned, and occurs through participation in a community of practice. Ericson’s deliberate practice, expertise development requires repetitive, effortful practice and feedback on performance.”

“Bandura’s Social Learning through observation, role modelling, and imitation. Debriefing is considered vital to learning from simulation, and for the transfer of learning so that it can be applied to other situations (Riviere, 2019). It even sometimes claimed (tongue in cheek) that “simulation is just an excuse to debrief.”

“Debriefing can be classified according to timing and facilitation, into three categories (Sawyer et al, 2016); Trained facilitator acts to guide the debrief conversation, participants debrief themselves and simulation is interrupted by the facilitator when needed to promote learning. Debriefing process elements (techniques, strategies, and tools used to optimize learning) have been identified by Sawyer et al (2016) as being of three types; Essential elements, Conversational techniques and educational strategies and debriefing adjuncts.”

“Grant et al (2018) have described different phenotypes of difficult debriefing situations, these include learners who are quiet or reticent, are disengaged or disinterested and dominate with poor insight and/or knowledge. They also react emotionally and with defensiveness When simulation occurs in work place, there is a bidirectional impact of psychological safety between the two (Purdy et al,2022).Established approaches to simulation debriefing can also be adapted to virtual debriefing, although challenges specific to this format need to be considered (Cheng et al, 2020).”

Simulation debriefing also has an important role in translational simulation, where the objective is to directly diagnose problems or to improve patients’ processes, rather than individual learning (Nickson et al, 2021). The aim of the debriefing process is two-way fold. Firstly, it is important to explain the rationale and purpose of the study to the participants and encourage feedback and questions. Also, the researchers to understand how the research experience was.”

2.6.2 Approach to debriefing

“Just as in non-educational debriefing, where there exists an ethical duty of facilitators to set a safe, confidential scene for facilitation, there is the ethical obligation for

learning for the facilitator in simulation-based learning to determine the parameters within which behaviour will be analysed, thereby attempting to protect participants from experiences that might seriously damage their sense of self-worth. Lederman, 1992). To ensure a successful debriefing process and learning experience, the facilitator must provide a supportive climate, where students feel valued, respected, and free to learn in a dignified environment. Participants need to be able to share their experiences in a frank open and honest manner (Pearson et al, 2018). The facilitator must create an environment of trust early on, typically in the pre-brief session. This relief period is the time when the facilitator illustrates the purpose of the simulation, the learning objectives, the process of debriefing, and what it entails. It is the period where the participants learn what is expected of them and set the ground rules for their simulation-based. It is also time for the facilitator to reflect on the learning objectives and to consider that every participant comes to the simulation with a pre-existing set of individual frames and life experiences previous experiences have an impact on how effective training will be, and need to be taken into consideration irrespective of the debriefing model employed. Systemic debriefing for critical events facilitates dynamics (Gabriel et al., 2021). These frames or internal images of reality how a person perceives something relative to someone else, affect the way receive, process, and assimilate. The simulated scenario and the debriefing technique employed need to consider individual learning styles.”

“This factor is illustrated by Kolb with the incorporation of the experiential learning cycle with the basic learning styles. Four prevalent learning styles are Identified diverging, assimilation, converging, and accommodating. However, without a facilitator participant may have trouble moving out of this first descriptive phase, particularly the active participant who is emotionally absorbed in the event and is

blinker in their view of what has occurred (Hayes, 2021). This challenge for the facilitator is to allow enough time for defusing to occur but direct the discussion in a more objective, broad-based capacity. The facilitator needs to move the discussion away from the very personalized account of what the participant thought occurred, to a more global perspective, away from the individual to the group, and the person to the event, but be cognizant not to cut the participant off, or make him/her feel alienated.”

2.6.3 Objectives of the debriefing session

The design of the debriefing session should be tailored to the learning objectives and the participant and team characteristics. Objectives may be well defined, and specified beforehand, or may be emergent and evolve within the simulation. For well-defined objectives, such as a technical skill as a particular team behaviour, the debriefing session allows examining how closely participants' performance has approached a known target, and what needs to be done to bridge any observed gaps between performance and target. It also allows sharing these objectives with the participants.”

The facilitator has a role in the debriefing process. There is tension between making participants active and responsible for their learning versus ensuring they address important issues and extract maximum learning during debriefings (Salifu, 2019). Data from the survey of participants indicate that the perceived skills of the debriefed have the highest independent correlation to the perceived overall quality of the simulation experience. A recent study of facilitation in problem-based learning illustrated that while facilitators felt that a formal training course provided sufficient skills to commence debriefing, it was only with experience, and in the presence of an expert role model that they became more comfortable with the process. In the same

study, students commented on the skill of facilitators as being an important factor in the learning process and the credibility of the course. Basic and advanced courses and refresher courses in facilitation are probably universally required.”

Several studies have found out debriefing process beneficial. In a study aiming at improving dynamic decision-making and task performance involving computer simulation-based interactive learning environments, the study assessed participants' skills in managing a dynamic task, such as playing the role of fish fleet managers in an environment of over-exploitation and mismanagement of renewable resources. Thirty-nine participants were examined over four parameters: task performance, structured knowledge, heuristics knowledge, and cognitive effort. Across all four domains, the group who were debriefed did better. Similarly, in a medical simulation study, Savoldell et al. found that participants' non-technical skills failed to improve if they were not debriefed.”

As Dismukes et al. state:” When it comes to reflecting on complex decisions and behaviours of professionals complete with the confrontation of ego, professional identity, judgment, motion, and culture, there will be no substitute for skilled human beings facilitating an in-depth conversation by their equally human peers.”

2.7 Summary

Healthcare educators are integrating simulation-based learning in their curricula to enhance the acquisition of critical skills. The introduction of simulation-based learning in healthcare is bound to translate into improved patient care, quality care delivery, and enhanced patient safety (Houghton, Casey, Shaw, & Murphy, 2021). Medical simulation involves the creation of a learning environment where the learning process occurs through the use of technological devices, mannequins, or

simulated patients. The simulated patients and mannequins, or simulated patients. The simulated patients and mannequins are presented with symptoms of a disease. The learners then review the patient, gather the history of the illness, and prescribe the next course of action (Houghton et al., 2012).”

Medical-based simulation helps students act out real-life medical situations in preparation for real-life clinical scenarios. The integration of simulation as part of the learning process enables healthcare students to perform medical procedures on models under the observation and guidance of their tutors. The method thus eliminates the occurrence of errors (Haraldseid et al., 2015). Simulation learning is also important because it provides a platform for repeated learning, thus enhancing the accuracy and retention of the procedure (Abraham & Singaram, 2016). As a result, students leave their learning institution with confidence that they can handle real medical situations in real healthcare settings. Systemic debriefing for critical events facilitates dynamics (Gabriel et al., 2022). While a medical-based simulation will never replace real-life clinical experiences, it provides students with an ideal learning opportunity before they graduate (Abraham & Singaram, 2016). The educational strategy to achieve specific goals related to learning or evaluation in a safe and supportive environment is referred to as simulation-based learning (Salifu et al., 2019). When simulation occurs in the work place, there is a bidirectional impact on psychological safety between the two (Purdy et al, 2022). Established approaches to simulation debriefing can also be adapted to virtual debriefing, although challenges specific to this format need to be considered (Cheng et al, 2020).”

David Kolb is an American educational theorist who published his ideas about experiential learning in 1984. His four stages of learning are:

Concrete Experience: The cycle begins with the learner having a concrete experience. This means either learning something brand new or experiencing something familiar in a new way.

Reflective observation: The next stage of the cycle is about reflection after having a concrete experience, the learner should spend some time thinking about what happened, or watching others doing the same thing and reflecting on what's occurring.

Abstract Conceptualization: After the learner has reflected on their concrete experience, they make sense of their experience and reflections. They may think about their next steps for improving, come up with a plan of action, or confide in literature or an expert who can offer insight. This allows them to form new ideas, or modify existing abstract ideas so that they can act afterwards.

Active Experimentation: The final stage of Kolb's cycle is about acting on your previous reflections and thoughts, and this is known as active experimentation. The learner applies what they have learnt from the initial experience and sees if there are any modifications when they try the experience for a second time. This is essentially an opportunity to test new ideas.

The learner will have a new concrete experience as the cycle will start all over.

Experiential learning theory differs from cognitive as behavioural theories in that cognitive theories emphasize the role of mental processes while behavioural theories ignore the possible role of subjective experience in learning process. The experiential theory proposed by Kolb takes a more holistic approach and emphasizes how experiences including cognition, environmental factors, and emotions, influence the learning process. In the experiential model, Kolb describes two different ways of

grasping experience: concrete experience and abstract conceptualization. He also identified two ways of transforming experience: reflective observation and active experimentation. According to Kolb, concrete experience provides information that serves as a basis for reflection. From these reflections, we assimilate the information and form abstract concepts.”

Effective learning is seen when a person progresses through a cycle of four stages (1) having a concrete experience followed by (2) observation of and reflection on that experience which leads to (3) the formation of abstract concept (analysis) and generalizations(conclusions) which are then (4) used to test hypothesis in future situations resulting in new experiences. The cycle begins with an experience that the student had, followed by an opportunity to reflect on that experience. The students may conceptualize and conclude what they experienced and observed leading to future actions in which students experiment with different behaviours. This begins the cycle a new as students have a new a new experience based on their experimentation. Kolb (1984) views learning as an integral process with each stage being mutually supportive of and feeding into the next. It is possible to enter the cycle at any stage and follow and follow it through logical sequence however, effective learning only occurs when a learner can execute all four stages of the model. Kolb’s learning theory (1984) provides support to simulation -based learning.”

According to Kolb, knowledge is built by transforming experience in a recursive cycle among four adaptive learning modes: concrete experience (feeling), reflective observation (observing) abstract conceptualization (thinking) and active experimentation (doing). Through reflection, students assign a meaning to an experience, conceptualizing and incorporating it into their cognitive structure. This enhanced knowledge, when replicated in a new experience followed by another

reflection, will produce new knowledge (Cummings & Connelly, 2016). Students not only learn from the experience, but also reflection on the experience, continuously expanding their knowledge (Kolb et al., 2015). Simulation allows students to understand the experience through apprehension (Concrete experience) and comprehension (abstract conceptualization) and prepare themselves to transform the experience by intention (reflective observation) and extension (active experimentation). According to Kolb (1984), the complexity and integration of didactic conflicts between adaptive learning modes are divided into three key stages of development: acquisition (basic skills), specialization (ability to apply concepts to reality) and integration (continuous reflection and improvement).”

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter focused on the methodology that was used to guide the study. The researcher explored perceptions of nursing students on simulation as a learning strategy at nursing training colleges, Nairobi County. It focused on research design, variables, location of the study, target population, sampling techniques, sample size determination, research instruments, pretesting of the data collection tools, data collection techniques and ethical considerations. Data collection is an important step in research. It is also known as field work. It involves administering the research tools to gather data. Data collection consists of taking ordered information from reality and transferring to some recording systems so that behaviour can be understood and predicted. It is based on research design.”

3.1 Research Design

The research design refers to the conceptual structure within which research is conducted. Research design in the plan, structure and strategy of investigation conceived to obtain answers to research questions and to control variance. It constitutes the blue print for the collection, measurement, and analysis of data and includes the outline of what the researcher does from writing the hypothesis to the final analysis (Elfil, 2017). A good research design possesses the following elements; the purpose statement, data collection methods, types of research methodologies, prerequisite required in the study and challenges, and measures the analysis in the study. The research design is important to a researcher as it reduces inaccuracy, increases efficiency and reliability. Research design also minimizes waste of time, helps in testing the hypothesis and provides a direction to the research. The purpose of the

research design was to provide answers to research questions and to control the variance.”

Major types of Research design are broadly divided into quantitative and qualitative design (Tuovila et al 2023). Qualitative research design aims at finding answers to who, what, where, how, and when through the course of research. The outcome of the quantitative is easily to represent in the form of statistics, graphs charts and numbers. Types of qualitative research include Descriptive, correlational, Quasi experimental and exploratory. These attempts to establish cause -effect relation-ship among the variables. Descriptive design is a theory-based method describing the research’s primary subject matter. It is designed to essentially obtain information about the current state with direct application to the working setting. This type of research design uses data collection techniques like natural observation, case studies, and survey to derive results. This type of design provides insight into the why and how of research. Experimental design looks at a problem scientifically by establishing a clear cause and effect of every event. Controlled project conducted for the purposes of testing a hypothesis or effect. Two groups selected randomly, experimental group and control group. The experimental group receives a new treatment, while the control group receives normal treatment followed by observation / measurement. It also tries to understand the impact of the independent variable on the dependable variable. Often social sciences use it to observe human behaviours and understand the social psychology of human beings better.”

The main aim of the Explanatory research design is to explore the subject’s undiscovered aspects and answers questions like what, how, and why. In this research design, the researcher explores the concepts and ideas on a subject to explore more theories. Correlational research design establishes a relationship between two related

variables. Collection of data on two or more variables on the same group of subjects and computing a correlation. The researcher observes the variables overtime and the draws conclusions based on them. This type of research design requires two different groups. Correlation coefficient determines the relationship two variables. The value of the correlation coefficient ranges between -1 and +1. If the correlation is +1, it indicates a positive relationship between the two variables, and -1 means a negative relationship. Qualitative design research focuses on finding answers to how and why. It uses open – ended questions and help the subjects express their views clearly. Qualitative research design is ideal for businesses that aim to understand customers' behaviours and requirements.”

In this study, the researcher adopted a descriptive exploratory design with a self – reporting survey to determine the perception of nursing students on simulation as a learning strategy. The descriptive design enabled the researcher to describe a picture of a phenomenon under investigation. Survey research is a process that involves answering to questions and is considered a common type of descriptive survey. The study includes interrelations among sociological factors. The objective of the survey is to employ questionnaire and interviews as the core means of collecting data. In this study the researcher was interested in the characteristic of the whole population and focused on registered diploma nurses training at nursing schools, in Nairobi County. A sample was selected to represent the population. One of the main advantages of survey research is that it assembles a large amount of information from many individuals using only one instrument. Therefore, this study used the descriptive survey design to collect data from diploma nursing students (KRCHN) on their perceptions on simulation as a learning strategy.”

3.2 Study area

This study was conducted in Nairobi County at four nursing colleges that do a diploma level program. The KMTC Nairobi campus representing a parastatal, Pumwani School of Nursing and Midwifery representing Municipal, St. Francis Kasarani faith based and Gertrude's private schools of nursing.”

3.3 Types of data

Varieties of data existence can be obtained but only few types are relevant to each research study. They can be classified on the basis source, quantification, function and others. By nature of data, there are two types of data: facts and opinion. Facts describe tangible things. They measure anything that exists or can exist. Facts then described as things done or a piece of information having objectives reality. Facts can be intangible as long as they can be determined. Example, the distance between Gatua and Kitale is 5kms, and The Governor of Trans-Nzoia County is Honourable George Ntembea. Opinions are how people perceive something. They are what people believe about something and what whose beliefs signify. They are the results of people attitudes, intentions, knowledge and motives. These all reflects people's perception about matter. It can be an attitude or image. Attitudes are mental sets or predispositions to some manner. An image is what something is like.”

3.3.1 Sources of data collection

Data may be collected from several sources. Researchers use these sources according to their data needs. However, the general classification of data collection sources can be presented under two groups:

3.3.1.1 Primary data sources

Primary data are first hand, original data collected by the researchers for the research project by hand. They are collected for meeting specific objectives of the study. They can be obtained from family's representatives, organization, etc. interviews, questionnaire, observation are the major tools for collecting data from primary sources. Primary sources are publications in individuals who do research, report and report the results of their study, they communicate findings directly to readers. Examples include: Journals, journals published monthly, quarterly or yearly articles in which they typically report on a particular researcher's study. They provide a direct description of an occurrence. Normally a panel of scholars in that field has reviewed them. Other primary sources are research reports, collective works and conference papers.”

For this study, data was collected from the source of information; the Kenya registered nursing students doing a diploma course in nurse training colleges in Nairobi County. This data is more reliable and had more confidence level of decision-making. These sources included raw data and original research (Kothari, 2012).”

3.3.1.2 Secondary data sources

Provides secondary data Secondary data are already gathered by others. They are attained indirectly. The researcher doesn't obtain from them directly. They are collected by other researchers before and have been processed at least once. Types of secondary data includes internal and secondary. Internal secondary data are available from in-house source. The source likes within the organization. Such sources include representative's report, shipment records, accounting data etc. External secondary data are available from the source outside the organization. Such sources include published reports, library, computer, data books etc.”

For this study, a desk review was conducted to collect data from different sources which include journals, reports, documents and internet sources and literature with information related to perception of nursing students towards simulation (Kothari, 2012).”

3.4 Importance of Data Collection

Data collection completely fulfils the data requirements of a research project. It is the connecting link for the researchers to the world of reality. It provides the sources of comparative, data by which by data can be interpreted and evaluated against each other. Based on the data collection, data are presented and analysed.”

It suggests the type and method of data for meeting the information needed. Several data collection methods are used to collect several types of data. Data serves as a source of future reference and evidence because they are used to prepare written records. They can now produce lots of material for the subsequent research. Data helps to take ordered information from reality and transforming into some recording system so that it can be later examined and analysed. It is from the pattern that social behaviour can be predicted.”

3.5 Population and Sample Size

3.5.1 Study population

Cooper and Schindler (2014) assert that population refers to the gathering of elements about which the researcher wishes to make an inference. Saunders et al. (2012) explain that the population is the set of cases or items from which an appropriate sample is taken to study. A population element however is the individual item on which measurement is taken, according to Cooper and Schindler (2014). The study population was nursing students training at a diploma level in Nairobi County. For

this study, the target population consisted of diploma nursing students (KRCHN) in 1st, 2nd and 3rd year in Nairobi County.”

Table 3.1 Sample population

COLLEGE	REPRESENTATION	NO. OF STUDENTS
KMTC Nairobi Campus	Parastatal	250
Pumwani School of Nursing and Midwifery	Municipal	130
Getrudes School of Nursing	Private	17
St Francis School of Nursing, Kasarani	Faith Based	73
TOTAL		470

3.6 Sampling Design

A sample is a small proportion of a population selected for observation and analysis. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn. Samples are chosen in a systematic random way, so that chances or the operations of probability can be utilized. Therefore, a sample is just a part of a population selected according to some rule or plan. Reasons for sampling include; the population may be too large for complete enumeration and the enumeration or measurement process may be destructive. Samples save time and money, and sampling allows more time to be spent on training, testing and checking. Sampling is a process in statistical analysis where researchers take a predetermined number of observations from a larger population (Tuovila et al., 2023).”

Sampling allows researchers to use small group from a larger population to make observations and determinations. The importance of sampling is to get a

representative group that will help the researcher to get the required information from the population. Sampling methods can be divided into two; Probability sampling and non-probability sampling. Probability sampling is a kind of sampling that every member of the population has an equal chance of being selected. In some cases, it can be impossible to study every individual in the group. That is why a small portion to represent is to represent the entire group. This is called a sample. The chosen sample should be a fair representation of the entire population.”

However, sampling error may occur due to inherent characteristics of the sampling procedure itself. It may occur randomly or because there is some form of bias. For instance, some member of the sample group may choose not to participate, or they differ in opinion in some way from other participants. Sampling is not an exact science, so the results should be taken as generalization. In this study the researcher reduced errors by; proper demarcation and identification of variables, used suitable instruments-tested the instruments used supervisors for guidance.”

3.7 Sampling Technique

Random sampling techniques include simple random sampling, systemic random sampling, stratified simple random sampling, stratified random sampling. For stratified sampling technique the researcher needs to establish sampling frame and define the criteria of stratification, listing the proportion according to defined strata or criteria. Each stratum will be computed to provide a proportionate sample, then select a sample for each stratum proportional to the relative size of the strata using the listing and a table of random numbers.”

Stratified sampling was applied, under this the population was divided into several sub-group population that are individually more homogeneous than the total

population (the different sub-populations are called strata) and then selected items from each stratum to constitute a sample. Stratified sampling results were more reliable and detailed. The sampling technique used to select nursing students was stratified random sampling procedure. The stratification was based on college block system and clinical rotation placements. The 470 students were stratified by the year of study. The number of student respondents per year of study was determined by the weight of class to the total population.”

3.8 Sample Size Determination

Krejcie and Morgan’s table is commonly used in quantitative research to estimate an appropriate sample size. It provides a systemic approach to determining the sample size needed for a study. It is important because the researcher does not have access to the entire population of interest and need to make inferences based on a representative. By estimating an appropriate sample size, researchers can obtain the necessary data to describe the characteristics of the population and make valid inferences.”

The Krejcie& Morgan table 1970 was used to calculate the sample size.

$$S = \frac{X^2 NP (1-P) + d^2 (N-1) + X^2 P (1-P)}{d^2}$$

S= required sample size

N= population size

X^2 =table value of chi-square for 1-degree freedom at the desired confidence level (3.841)

P=the population proportion (assumed to be 0.5 since this world provide the maximum sample size).

d= the degree of accuracy expressed as a proportion (0.05)

N=Population size of 470

S=Sample size is 210

3.9 Data Collection and Research Instruments

Instrumentation is the process of selecting or developing measuring devices and methods appropriate to a given research problem. Research instruments are devices, which assist a researcher in collecting necessary information or data. Requirements for a research instrument must be valid and reliable.”

3.10 Validation of a Research Tool

3.10.1 Validity

Extend to which research instrument measures what it is designed to measure. Three types of validity; Content validity, Predictive validity and Construct validity. Validity refers to the accuracy and meaningfulness of the inferences based on the degree to which an instrument obtains the data that is supposed to get. Pilot study also helped in validation of the instruments through amending unclear and obscure questions and discarding ineffective and non-functional questions. To ensure validity the researcher gave the instrument to her supervisor to check validity before using it in data collection.”

3.10.2 Content Validity

Content validity has two varieties, face validity and sampling validity. Face validity is concerned with the extent to which a research instrument measures what it appears to measure according to the researcher’s subjective assessment. Sampling validity refers to the extent a research instrument adequately samples the content population of the property being measured. Content validity refers to the extent to which the items on a

test are representative of the entire domain the test seeks to measure. Content validity is an important research methodology term that refers to how well a test measures the behaviour for which it is intended. A test has a content validity if it measures knowledge of the content domain of which it was designed to measure knowledge; also, the content validity concerns the, primarily, the adequacy with which the test items adequately and representatively sample the content area to be measured. Content validity is important; it is often seen as a pre-requisite to criterion validity, because it is a good indicator of whether the desired trait is measured. If the elements of the test are irrelevant to the main construct, then they are measuring something else completely, creating potential bias. In this study pilot study also helped in validation of the instruments through amending unclear and obscure questions and discarding ineffective and non-functional questions by the advice of the supervisors.”

3.10.3 Construct Validity

Concerned with the extent to which research serves to predict some meaningful traits or constructs in the candidate; Data obtained from research instrument should accurately reflect or represent a theoretical concept. Assuming that there is a casual relationship in this study, can we claim that, the programme reflected well our construct of the program and that our measure reflected well our idea of the constructs of the measure? Construct validity in a study can also be assessed if two or more different instruments are used to measure the same concept. Does the test relate to underlying theoretical concepts? Construct validity is measured through correlation with other tests measuring a similar construct, the coefficient should not be too high as that may indicate too much of measuring something else. Construct validity can measure against a test that should be measuring something independent (different) from the researcher test.”

3.11 Techniques for Validating Research Tool

Process of collecting evidence to support the inference attached to the information obtained. The presence or absence of systemic error in data largely determines validity. Techniques include; Construct validity, content validity, and criterion related validity. Construct validity in a study can also be assessed if two or more different instruments are used to measure the same concept. In this study, the Construct validity was established by determining if the scores recorded by an instrument are meaningful, significant and had a purpose. In this study the construct validity was achieved, the scores were assessed statistically and practically. Types of validity depends on the source population of interest for generation. Internal validation is the extent to which findings from the study population reflect true underlying parameters /casual effects in the target population. External validity is the extent to which findings from the study population reflect the true underlying parameters /casual effects in a defined external population beyond the target population.”

The researcher used a structured questionnaire to collect primary data. Each respondent was requested to reply a list of questions based on the objective. Secondary data was collected through literature and desk review, reports and documents related to perception of nursing students on simulation. Pre-test for questionnaires, interview schedules and tools were conducted to validate that that the tool content is valid. The content validity (questions answered without excluding important points), internal validity (outcomes answers researchers’ target) and the external validity were checked during the pilot test before basic data collection.”

3.11.1 Reliability

Reliability refers to the degree to which a research instrument yields consistent results after repeated trials (Mugenda and Mugenda, 1999). It is important in research to identify ambiguities and inadequate items in the research instrument.”

In this study, the reliability of the instrument used was measured through pilot study in which the questionnaire were administered and later responses cross-checked through the test-retest reliability and parallel reliability in which the former was involved in giving the questionnaires to the same group of respondents at a later point in time and the latter parallel equivalent forms of the questionnaires were developed and used to get the same information to ensure the ability to yield consistent results. Therefore, necessary changes were made before administering questionnaires to the target group.”

3.12 Data Collection Procedures

The researcher was issued with an introductory letter from the Dean school of education Moi University to apply for a permit from NACOSTI to enable her collect data, which was issued. Familiarization visits were done to the four sampled colleges followed by distribution of questionnaires to the students. The researcher identified two research assistants who were trained on how to identify the respondents and to engage them. Those who consented to participate were provided with the questionnaire to fill. The research assistants collected the questionnaires upon completion to the designated areas for analysis.”

3.13 Ethical Considerations

The researcher obtained the necessary research permit and identified herself to the respondents, throughout the process confidentiality was upheld and voluntary consent

maintained. The researcher followed the guidelines for good scientific practice. The researcher was granted permission to carry out the study by the Dean School of Education, Moi University before data collection. Permission was also granted by the National Commission of Science and Technology and Innovation.”

The respondents were allowed to withdraw from the study at any time desired. The purpose of the study explained to the respondents and results kept available to all respondents on request. The respondents were protected from discomfort and any anticipated harm in the study inform of physical, mental or even spiritual. Confidentiality of sources of research data and methodological requirements of the study that required concealment was up-held.”

3.14 Data Analysis Procedures

Quantitative data analysis was obtained from primary and secondary sources. This analysis was based data type using Excel, SPSS 20.0, and Office word format. This analysis focused more on the numerical values. Data from questionnaires was coded to SPSS 20.0. This task involved identifying, classifying and assigning a numeric or character symbol to data in a pre-coded. In this study all the responses from the questionnaires were pre-coded. They were taken from the list of responses. Raw data entries were reviewed for any errors and corrected to ensure accuracy and consistency.”

Quantitative data was analysed by statistics using frequencies, percentages, means and standard deviations. Inferential statistics included correlation coefficients, coefficients of determination, analysis of variance and the model coefficients and graphical analysis by exploiting the relationship between variables affecting each other. This was done through cross tabulation and correlation.”

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION INTERPRETATION AND DISCUSSION

4.0 Introduction

In this chapter, data analysis was done and findings presented. The findings were also interpreted in line with the study variables. The chapter first presented a section on the demographic information for the respondents. The purpose of the study was to determine the perception of nursing students on simulation as a learning strategy. The findings are then categorized into descriptive and inferential statistics.”

4.1 Response Rate

The researcher administered 210 questionnaires from four nursing colleges that do a KRCHN diploma level program. The KMTC Nairobi campus representing a parastatal, Pumwani School of Nursing and Midwifery representing Municipal, St. Joseph’s Kasarani faith based and Gertrude’s private schools of nursing. Table 4.1 presents response rate.”

Table 4.1: Questionnaire Return Rate

	Number of respondents	Response rate (%)
Responses	132	63.0
No response	49	27.0
Sample size	210	100.0

As shown in Table 4.1, while 132 of nursing students on a diploma programmesought completed and returned the questionnaires, 49 of them either failed to complete the questionnaire or failed to return. This translates to a response rate of 63 percent. Gall et al. (2007) asserts that, a response rate of over 60% of the target is adequate for a study. Babbie (2004) also asserted that return rates of above 50% are acceptable to

analyze and publish, 60% is good and 70% is very good. The researcher considered this response rate as very good surpassing the 70% threshold. Therefore, the response rate of 63 percent was considered adequate to generalise findings of this study.”

4.2 Demographic Information

The demographic information gathered included distribution of respondents by their gender, age and level of education and year of study.

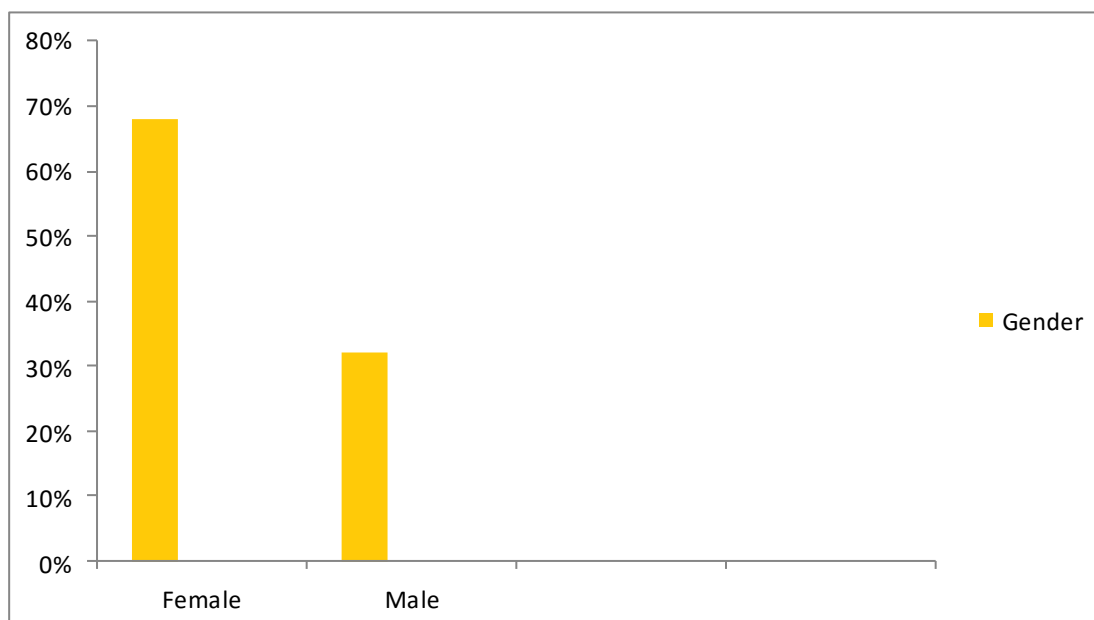


Figure 4.1: Age Bracket of Respondents

Figure 4.1 shows that 68% of respondents were female as 32% were male. This implies that majority of nursing students in Nairobi selected colleges are female. The perception that nursing is a female dominated career was therefore true for this case.

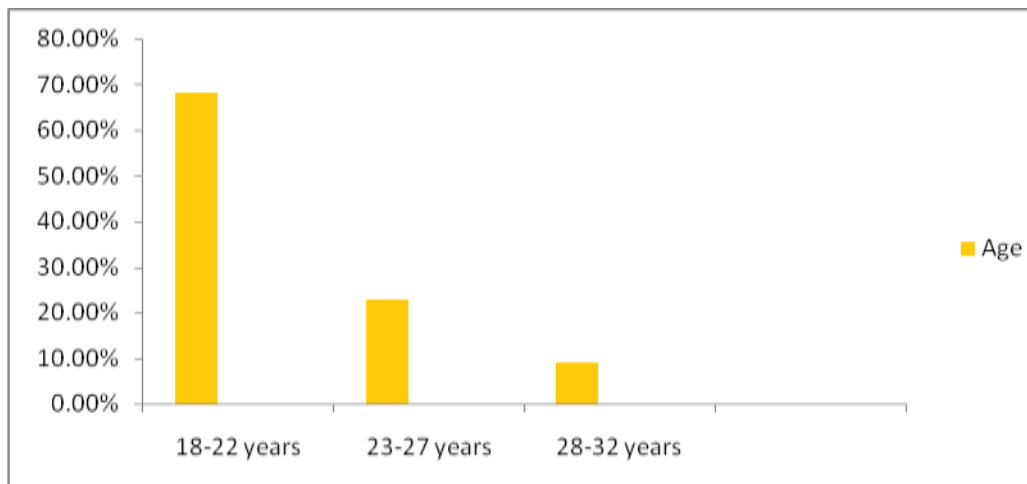


Figure 4.2: Age Bracket of Respondents

Figure 4.2 shows that age of the respondents was distributed between 18-22 years (68.2%), 23-27 years (22.7%), 28-32 years (9.1%). This implies that majority of nursing students in Nairobi selected colleges are youthfully age meaning joined mostly after high school hence could easily apply clinical simulation as a learning strategy.

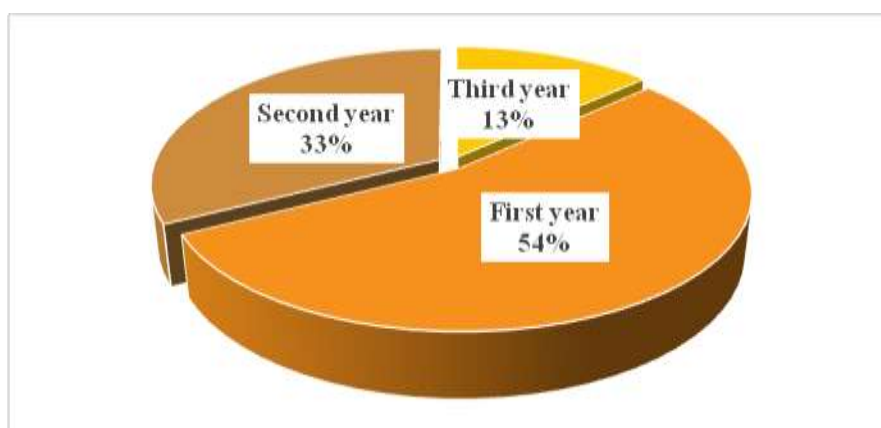


Figure 4.3: Year of study

Figure 4.3 shows that 54% of respondents (nursing students) were first years while 33% were second year students. The remaining 13% were third years. It emerged that the number kept reducing based on year of study indicating those in senior classes

were less willing to participate in research. This probably caused non-hundred percent response rate.”

The Demographic information helped the researcher identify trends and patterns within the diploma nursing students .This information was used to make more informal decision about simulation as a learning strategy.

4.3 Test of Normality

Test for normality was done on the dependent variable (that is data on simulation as a learning strategy) given that, when the sample size or the number of cases analyzed are at least thirty (30), violation of normality is not a problem for the predictors (Tabachnick & Fidel, 2007). Further, distribution of (Y) depends on the predictors and therefore the assumptions for the model state that the errors are normal since it (Y) is the only random variable in the model other than the errors. Normality of data on simulation as a learning strategy was tested using Normal Q-Q plot, One-Sample Kolmogorov-Smirnov Test, and Shapiro Wilk Test as shown in Table 4.2

Table 4.2: Kolmogorov-Smirnov and Shapiro-Wilk Tests

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Integration of simulation Programme	0.292	132	0.587	0.697	132	0.623
Classification simulation	0.301	132	0.291	0.717	132	0.399
Clinical Experience	0.308	132	0.222	0.702	132	0.765
Benefits of simulation	0.342	132	0.418	0.593	132	0.301
Simulation as a learning strategy	0.308	132	0.082	0.661	132	0.362

a. Lillie for Significance Correction

The difference between the observed distribution and a perfectly normal one is checked based on a p-value. If the p-value is less than 0.05, the distribution is significantly different from a normal distribution and might be cause for concern. If it is 0.05 or higher, there is no significant difference from normality. As shown in Table

4.3, the data for every variable was normally distributed as p-value was greater than 0.05, all p-values using both Kolmogorov-Smirnova and Shapiro-Wilk normality index being >0.05 .

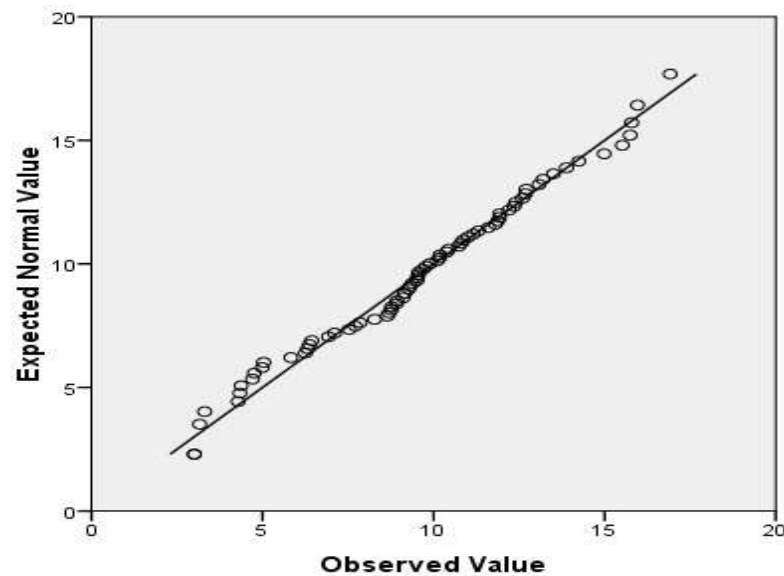


Figure 4.4: Normal Q-Q Plot of Simulation as a learning strategy

The output of a normal Q-Q plot was used to determine normality graphically. If the data is normally distributed, the data points will be close to the diagonal line. If the data points stray from the line in an obvious non-linear fashion, the data is not normally distributed. As shown in Figure 4.4, the data is normally distributed.

4.4 Descriptive Statistics

Descriptive statistics on variables was presented on a 5-point Likert-type scale data that was summarized using measure of distribution (percentages) measures of central tendency (mean) as well as measure of dispersal (standard deviation). Values of mean were used in this study to rank prevalence of different factors grouped with high mean indicating high prevalence. On the other hand, larger standard deviation implies a greater spread in the data. This section is organized in five sub-sections based on

components of integration of simulation program me, classification simulation, clinical experience, benefits of simulation and simulation as a learning strategy.

4.4.1 Integration of simulation Programme

Response on how nursing students felt about integration of simulation programme was provided. Results were provided in table 4.3.

Table 4.3: Integration of simulation Programme

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
My experience with simulation increased my level of confidence to face the real setting.	0.0	2.4	1.2	8.4	88.0	4.8	0.6
Conducting the simulation motivated me to learn.	2.4	1.2	4.8	15.7	75.9	4.6	0.8
Simulation gave me confidence in my technical abilities.	3.6	4.8	20.5	41.0	30.1	3.9	1.0
I consider that, if a teacher accompanies me during the simulation, I further develops my technical abilities.	0.0	2.4	1.2	4.8	91.6	4.9	0.5
I consider that the teacher fosters the simulation to improve my learning	3.6	4.8	22.9	39.8	28.9	3.9	1.0
Average	1.9	3.1	10.1	21.9	62.9	5.5	0.8

As shown in Table 4.3 evaluated *integration of simulation programme*, nursing students of selected colleges in Nairobi revealed that, their *experience with simulation increased their level of confidence to face the real setting* which had a positive influence on simulation as a learning strategy (mean = 4.9, standard deviation = 0.5), conducting *the simulation motivated nursing students to learn* which had a positive influence on simulation as a learning strategy. (Mean = 4.8, standard deviation = 0.6) at the same time, *simulation gave nursing students confidence in their technical abilities* which had a positive influence on simulation as a learning strategy (mean =

4.6, standard deviation = 0.8). Nursing students *considered that, if a teacher accompanied them during the simulation it developed their technical abilities* which had a positive influence on simulation as a learning strategy (mean = 3.9, standard deviation = 1.0). Basing on the average mean *and standard deviation integration of simulation programme* had a positive influence on simulation as a learning strategy.

4.4.2 Classification simulation

Respondents were required to give response that best described how simulation affects nursing student's clinical experience. Results were provided in table 4.4.

Table 4.4: Classification simulation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
Simulation classifications helps you understand concepts better in the clinical setting.	1.2	2.4	12.0	22.9	61.4	4.4	0.9
Simulation classifications continues to be an integral part of the clinical experience.	2.4	1.2	4.8	15.7	75.9	4.6	0.8
Simulation classification of mannequins is a realistic tool to learn to evaluate the real situation	0.0	3.6	12.0	21.7	62.7	4.4	0.8
Simulation classifications be partial substitute for clinical experiences in the hospitals	3.6	4.8	12.0	56.6	22.9	3.9	0.9
Because of using simulation classification, you will be less nervous in the clinical setting when providing care for similar patients.	3.6	3.6	3.6	44.6	44.6	4.2	0.9
Average	2.2	3.1	8.9	32.3	53.5	4.3	0.9

As shown in Table 4.4 responds to classification simulation, respondents highly rated that, their *simulation helped them to understand concepts better in the clinical setting* which had a positive influence on simulation as a learning strategy (mean = 4.6, standard deviation = 0.8), Respondents noted that *simulation continues to be an*

integral part of the clinical experience which had a positive influence on simulation as a learning strategy (mean = 4.4, standard deviation = 0.8). Additionally, nursing students asserted that *simulation is a realistic tool to learn to evaluate the real situation* which had a positive influence on simulation as a learning strategy (mean = 4.4, standard deviation = 0.9). Besides, *simulation was a partial substitute for clinical experiences in the hospitals* which had a positive influence on simulation as a learning strategy (mean = 4.2, standard deviation = 0.9) furthermore *because of simulation, nursing students were less nervous in the clinical setting when providing care for similar patients* which had a positive influence on simulation as a learning strategy (mean = 3.9, standard deviation = 0.9). The mean average was found to be 4.3 with standard deviation being 0.9. This implied that classification simulation had a positive influence on simulation as a learning strategy. This finding agrees with (Rickets, 2011) that lecturing, concept mapping, case study, brain storming, demonstration, role play and question and answer method enable simulation process.”

4.4.3 Clinical Experience

Nursing students gave responses on debriefing experience and results were provided in table 4.5.

Table 4.5: Clinical Experience

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
Debriefing should continue to be an integral part of clinical experience	0.0	2.4	4.8	6.0	86.7	4.8	0.6
Because of debriefing I will be less nervous in clinical setting when providing care for similar patients	2.4	1.2	8.4	9.6	78.3	4.6	0.9
Debriefing experience support my reasoning and ability to perform in the clinical setting	3.6	3.6	1.2	6.0	85.5	4.7	0.9
My actions with the simulation improved my technical abilities and confidence	3.6	8.4	18.1	39.8	30.1	3.8	1.1
Simulation mimics improves evaluative setting	3.6	8.4	19.3	38.6	30.1	3.8	1.1
Average	2.7	4.8	10.4	20.0	62.2	4.3	0.9

Table 4.5 shows findings on clinical experience for nursing students on simulation as a learning strategy. The results indicate that, debriefing should continue to be an integral part of clinical experience (mean = 4.8, standard deviation = 0.6), *Because of debriefing learners were less nervous in clinical setting when providing care for similar patients* which had a positive influence on simulation as a learning strategy (mean = 4.7, standard deviation = 0.9). At the same time, *debriefing experience supported students reasoning and ability to perform in the clinical setting* which had a positive influence on simulation as a learning strategy (mean = 4.6, standard deviation = 0.9). Though not highly prevalent, *learners' actions with the simulation improved their technical abilities and confidence* which had a positive influence on

simulation as a learning strategy (mean = 3.8, standard deviation = 1.1). Further, *simulation mimics improves evaluative setting* which had a positive influence on simulation as a learning strategy (mean = 3.8, standard deviation = 1.1). The average mean on clinical experience was found to be 4.3 with standard deviation being 0.9. This implies that clinical experience had a positive influence on simulation as a learning strategy. These findings agree with Hertel and Millis (2017) who noted that simulation places students at the centre of the learning experience and allows students to construct new knowledge and also gain knowledge from fellow learners' experiences.

4.4.4 Benefits of simulation

The study established the benefits of simulation. Results are provided in table 4.6.

Table 4.6: Benefits of simulation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Standard Deviation
Simulation promotes my critical thinking	1.2	1.2	2.4	20.5	74.7	4.7	0.7
Simulation reduces anxiety and fear during learning	2.4	1.2	4.8	12.0	79.5	4.7	0.8
Simulation provides timely debriefing and feedback from tutors/clinical instructors	0.0	2.4	1.2	4.8	91.6	4.9	0.5
Simulation promotes self-awareness of communication to students	3.6	3.6	4.8	43.4	44.6	4.2	1.0
Simulation helps me identify gaps in knowledge and experience.	2.4	4.8	3.6	38.6	50.6	4.3	0.9
Average	1.9	2.7	3.4	23.9	68.2	4.6	0.6

Regarding simulation benefits, Table 4.6 shows that, simulation promotes nursing students critical thinking (mean = 4.9, standard deviation = 0.5), at the same time, simulation reduces anxiety and fear during learning (mean = 4.7, standard deviation

= 0.7), Simulation provide timely debriefing and feedback from tutors/clinical instructors (mean = 4.7, standard deviation = 0.8). Respondents also disclosed that, ssimulation promote self-awareness of communication to students (mean = 4.3, standard deviation = 0.9), Simulation helps me identify gaps in knowledge and experience (mean = 4.2, standard deviation = 1.0). The average mean was found to be 4.6 with a standard deviation of 0.6. This implies that simulation numerous benefits to learners. This finding agrees with Fink (2013) who emphasized that the importance of learners being actively engaged in satisfying significant learning experiences, students developed confidence to face the real world, and simulation motivated them to learn and developed technical abilities.

4.5 Inferential Statistics

Inferential statistics was based on correlation coefficients, coefficients of determination, analysis of variance and the model coefficients.

4.5.1 Correlation Coefficients

Table 4.7: Correlation Coefficients

		Integration simulation	Classifications	Credit risk clinical experience	Benefits of simulation	Simulation as learning
Integration of simulation Programme	Pearson Correlation	1.000	0.709	0.685	0.694	.872**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	132	132	132	132	132
Classification simulation	Pearson Correlation	0.709	1.000	0.674	0.660	.823**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	132	132	132	132	132
Clinical Experience	Pearson Correlation	0.685	0.674	1.000	0.585	.893**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	132	132	132	132	132
Benefits of simulation	Pearson Correlation	0.694	0.660	0.585	1.000	.825**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	132	132	132	132	132
Simulation as a learning strategy	Pearson Correlation	.872*	.823**	.893**	.825*	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	132	132	132	132	132

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4.7 indicates a Pearson Correlation coefficient between Simulation as a learning strategy and every explanatory variable was found to be significant at both 95% and 99% confidence level and 2-test with correlation coefficient being 0.872, 0.823, 0.893, 0.825 respectively. This indicates that a very strong relationship between the Simulation as a learning strategy and Integration of simulation Programme, classification simulation, Clinical Experience as well as benefits of simulation.

4.5.2 Coefficient of Determination

Table 4.8: Coefficient of Determination

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Durbin-Watson
.985a	0.87	0.868	0.12807	0.87	1.774

a. Predictors: (Constant), Integration of simulation Programme, classification simulation, Clinical Experience as well as benefits of simulation
b. Dependent Variable: Simulation as a learning strategy

Results in Table 4.8 show an R-Square of 0.868 with the standard error of estimate being 0.128. This implies that using composite score, Integration of simulation Programme, classification simulation, Clinical Experience as well as benefits of simulations significantly influences Simulation as a learning strategy for nursing students. The researcher also tested for autocorrelation using Durbin Watson statistic which is always between 0 and 4 where a value of 2 means that there is no presence of autocorrelation in the residuals (prediction errors) from a regression analysis. The Hypotheses for the Durbin Watson test are:

H_0 = No first order autocorrelation

H_1 = First order correlation exists.

(For a first order correlation, the lag is one-time unit).

A rule of thumb is that, test statistic values in the range of 1.5 to 2.5 are relatively normal. Values outside of this range could be cause for concern. Field (2009) suggests that values under 1 or more than 3 are a definite cause for concern. For the current study, Durbin Watson statistic was 1.774 which falls within the relatively-normal range and therefore there was no autocorrelation in the residuals from regression analysis.

4.5.3 Analysis of Variance

Table 4.9: Analysis of Variance

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	40.683	5	8.137	496.077	.000a
Residual	1.263	77	0.016		
Total	41.946	82			

a. Predictors: (Constant), Integration of simulation Programme, classification simulation, Clinical Experience as well as benefits of simulation
b. Dependent Variable: Simulation as a learning strategy

As shown in Table 4.9, F-Calculated (5, 77) = 496.077 which is greater than F-Critical (5, 77) = 3.96 at 2-tail test and 95% confidence level. Results also show that p-value = 0.000 < 0.05. This further confirms that the predictors positively and significantly influence simulation as a learning strategy for nursing students. Analysis of variance is the statistical procedure for comparing the means of a variable across several groups of individuals. Sampled nursing colleges were compared with how much variation was within the sample. The purpose of the variance analysis was to help the researcher to make informed decision.

4.5.4 Model Coefficients

Table 4.10: Model Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	0.026	0.094		0.275	0.784
Integration of simulation Programme	0.502	0.065	0.505	7.714	0.000
Classification simulation	0.124	0.048	0.134	2.572	0.012
Clinical Experience	0.081	0.042	0.094	1.923	0.038
Benefits of simulation	0.236	0.047	0.236	4.985	0.000

a. Dependent Variable: Simulation as a learning strategy

Findings presented in Table 4.10 show that each of the predictors is held constant, simulation as a learning strategy for nursing students will remain at 0.026. At the same time, an increase in Integration of simulation Programme, classification simulation, Clinical Experience as well as benefits of simulation by one unit leads to an increase in simulation strategy by 0.502, 0.124, 0.081 and 0.236 units respectively with a p-value of <0.05 for each variable. This can respectively be summarized by the following model:

$$Y = 0.026 + 0.502X_1 + 0.124X_2 + 0.081X_3 + 0.236X_4$$

These findings confirm that simulation positively affect learning for nursing students. The learners may confidently grow their skills and knowledge, leading to deeper comprehension and a stronger sense of personal accomplishment Kim et al 2016.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presented summary of findings, conclusion and recommendations. The chapter additionally presented suggestions for studies.

5.1 Summary of the Findings

5.1.1 Integration of Simulation Programme

Nursing students of selected colleges in Nairobi revealed that their *experience with simulation increased their level of confidence to face the real setting* which had a positive influence on simulation as a learning strategy (mean = 4.9, standard deviation = 0.5), *Conducting the simulation motivated nursing students to learn* which had a positive influence on simulation as a learning strategy. (Mean = 4.8, standard deviation = 0.6) at the same time, *simulation gave nursing students confidence in their technical abilities* which had a positive influence on simulation as a learning strategy (mean = 4.6, standard deviation = 0.8). Nursing students *considered that, if a teacher accompanied them during the simulation, it developed their technical abilities* which had a positive influence on simulation as a learning strategy (mean = 3.9, standard deviation = 1.0). Respondents further stated that, they *considered that the teacher fostered the simulation to improve their learning* which had a positive influence on simulation as a learning strategy (mean = 3.9, standard deviation = 1.0). The average mean was found to be mean of 5.5 and standard deviation of 0.8.”

5.1.2 Classification Simulation

Respondents highly rated that their *simulation helped them to understand concepts better in the clinical setting* which had a positive influence on simulation as a learning strategy (mean = 4.6, standard deviation = 0.8), Respondents noted that *simulation continues to be an integral part of the clinical experience* which had a positive influence on simulation as a learning strategy (mean = 4.4, standard deviation = 0.8). Additionally, nursing students asserted that *simulation is a realistic tool to learn to evaluate the real situation* which had a positive influence on simulation as a learning strategy (mean = 4.4, standard deviation = 0.9). Besides, *simulation was a partial substitute for clinical experiences in the hospitals* which had a positive influence on simulation as a learning strategy (mean = 4.2, standard deviation = 0.9) furthermore *because of simulation, nursing students were less nervous in the clinical setting when providing care for similar patients* which had a positive influence on simulation as a learning strategy (mean = 3.9, standard deviation = 0.9). The mean average was found to be 4.3 with standard deviation being 0.9.

5.1.3 Clinical Experience

The results indicated that, debriefing should continue to be an integral part of clinical experience (mean = 4.8, standard deviation = 0.6), *Because of debriefing learners were less nervous in clinical setting when providing care for similar patients* which had a positive influence on simulation as a learning strategy (mean = 4.7, standard deviation = 0.9). At the same time, *debriefing experience supported students reasoning and ability to perform in the clinical setting* which had a positive influence on simulation as a learning strategy (mean = 4.6, standard deviation = 0.9). Though not highly prevalent, *learners' actions with the simulation improved their technical abilities and confidence* which had a positive influence on simulation as a learning

strategy (mean = 3.8, standard deviation = 1.1). Further, *simulation mimics improves evaluative setting* which had a positive influence on simulation as a learning strategy (mean = 3.8, standard deviation = 1.1). The average mean on clinical experience was found to be 4.3 with standard deviation being 0.9. This implies that clinical experience had a positive influence on simulation as a learning strategy.”

5.2 Benefits of Simulation

Simulation promotes nursing students critical thinking (mean = 4.9, standard deviation = 0.5), at the same time, simulation reduces anxiety and fear during learning (mean = 4.7, standard deviation = 0.7), Simulation provides timely debriefing and feedback from tutors/clinical instructors (mean = 4.7, standard deviation = 0.8). Respondents also disclosed that, simulation promote self-awareness of communication to students (mean = 4.3, standard deviation = 0.9), Simulation helps me identify gaps in knowledge and experience (mean = 4.2, standard deviation = 1.0). The average mean was found to be 4.6 with a standard deviation of 0.6. This implies that simulation numerous benefits to learners.

5.3 Conclusion

The researcher concluded that, integration of simulation programme, classification simulation, clinical experience as well as benefits of simulation significantly influences simulation as a learning strategy for nursing students had a positive influence on simulation as a learning strategy. Students therefore embrace simulation for their learning purposes.

5.4 Recommendations

Based on the research findings, this study presents some of the key policy recommendations that could support simulation as a learning strategy among learners:

- Nursing educators should make simulation as an integral part of their teaching for nursing students. Embracing integral approach will improve students' learning approach.
- The study strongly recommends formulation of a policy framework on classification of simulation approaches. Learners should know the classifications and practice them effectively.
- The study recommends that students should practice clinical skills to generate experience that would yield positive results.
- The study further recommends that nursing colleges should embrace simulation learning strategy as it has a lot of benefits to learners.

5.5 Suggestions for Further Studies

The current study was not exhaustive on all the aspects that researchers wished to include in addressing the research problem. Given this and other limitations, the researcher suggests the following for further studies; A study investigating the perception of nursing students on simulation as a learning strategy should be extended to other counties and colleges offering nursing programs in Kenya. The researcher also suggests more variables a moderator being inclusive (other than the one used in this study) to be considered and included for further research.

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APPENDICES**Appendix I: Consent Form**

*My name is **Cecilia Rapando**, a student at **Moi University**, undertaking a study to determine **Nursing students' perception on simulation as a learning strategy in nursing training colleges, Nairobi County, Kenya.***

***Confidentiality** will be observed throughout the study, do not write your name on the questionnaire, the information you provide **will only** be used for the purpose of the study and will not be shared to any other person.*

*In this study your participation is **voluntary and thus no compensation will be made.** Kindly, you can choose to participate or not.*

TICK WHERE APPROPRIATE

I have read the purpose of this research and I have understood and choose to /not to participate in this study

- **YES**
- **NO**

Appendix II: Questionnaire***PART 1 DEMOGRAPHIC DATA***

Do not write your name on this paper.

Put a tick to the appropriate response

1. Age bracket 18-22 23-27 28-32***2. Gender*** MALE FEMALE***3. Year of study*** FIRST SECOND THIRD

Simulation Evaluation Instrument

PART 2: Please circle the response that best describes how you feel about the simulation programme.

Objective One

	Strongly disagree	Disagree	Agree	Strongly agree	Neutral
1. My experience with simulation increased my level of confidence to face the real setting.	1	2	3	4	5
2. Conducting the simulation motivated me to learn.	1	2	3	4	5
3. Simulation gave me confidence in my technical abilities.	1	2	3	4	5
4. I consider that, if a teacher accompanies me during the simulation, I further develops my technical abilities.	1	2	3	4	5
5. I consider that the teacher fosters the simulation to improve my learning	1	2	3	4	5

Simulation Evaluation Instrument

PART 2: Please circle the response that best describes how you feel classification of simulation affects clinical experience

OBJECTIVE TWO

	Strongly disagree	Disagree	agree	Strongly agree	Neutral
Debriefing should continue to be an integral part of clinical experience	1	2	3	4	5
Because of debriefing I will be less nervous in clinical setting when providing care for similar patients	1	2	3	4	5
Debriefing experience support my reasoning and ability to perform in the clinical setting	1	2	3	4	5
My actions with the simulation improved my technical abilities and confidence	1	2	3	4	5
Simulation mimics the care provided to the patient in a safe and evaluative setting.	1	2	3	4	5

Simulation Evaluation Instrument

PART 2: Please circle the response that best describes how simulation affects your clinical experience

OBJECTIVE THREE

	Strongly disagree	disagree	agree	Strongly agree	Neutral
Simulation helps you understand concepts better in the clinical setting.	1	2	3	4	5
Simulation continue to be an integral part of the clinical experience.	1	2	3	4	5
Simulation is a realistic tool to learn to evaluate the real situation.	1	2	3	4	5
Simulation be partial substitute for clinical experiences in the hospitals	1	2	3	4	5
Because of simulation, you will be less nervous in the clinical setting when providing care for similar patients.	1	2	3	4	5

Simulation Evaluation Instrument


PART 2: Please circle the response that best describes the benefits of simulation

Objective four

	Strongly disagree	disagree	agree	Strongly Agree	Neutral
Simulation promotes my critical thinking	1	2	3	4	5
Simulation reduce anxiety and fear during learning	1	2	3	4	5
Simulation provide timely debriefing and feedback from tutors/clinical instructors	1	2	3	4	5
Simulation promote self-awareness of communication to students	1	2	3	4	5
Simulation helps me identify gaps in knowledge and experience.	1	2	3	4	5

THANK YOU FOR PARTICIPATION AND COMPLETING THIS SURVEY.

Appendix III: Study Permit



MOI UNIVERSITY
Office of the Dean School of Education

Tel. Eldoret (053) 43001-8/43620
Fax No. (053) 43047

P.O. Box 3900
Eldoret, Kenya

REF: EDU/PGP/1011/16 DATE: 29th March, 2022

THE EXECUTIVE SECRETARY
National Council for Science and Technology
Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH PERMIT IN RESPECT OF CECILIA NYAKOWA RAPANDO – EDU/PGP/1011/16

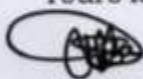
The above named is a 2nd year Master of Education Student at Moi University, School of Education, Department of Educational Psychology.

It is required of her M.Ed studies to conduct a research project and produce a research report. Her research topic is entitled:

“Perception of Nursing Students on Simulation as a Learning Strategy at Nursing Training Colleges, Nairobi County.”

Any assistance given to enable her conduct research successfully will be highly appreciated.


Yours faithfully,

 29.03.2022
PROF. J. K. CHANG'ACH
DEAN, SCHOOL OF EDUCATION

MOI UNIVERSITY
SCHOOL OF EDUCATION
NAIROBI

28 MAR 2022

EXECUTIVE SECRETARY

 (ISO 9001:2015 Certified Institution)

Appendix IV: NACOSTI Permit

	
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
P.O. Box 30623 - 00100 Nairobi Tel: 020-4007000, 0713788787 INVOICING DATE: 24/May/2022	

INVOICE: **10009**

INVOICE TO:
 Cecilia Nyakira Kapumba
 Kenya

ITEM DESCRIPTION	CATEGORY OF RESEARCH	PROCESSING FEE	TOTAL AMOUNT (KES)
Application Fee For - Research (Masters) Humanities and Social Sciences - Kenyan Citizens	Research (Masters)	1,000	1,000
Total Amount Payable (KES)			1,000

Issued By : -

Payment to be made to our account as detailed below:

East African Citizens - Kenya Shillings Account

Mobile money: Online Mpesa Express

or

Account Name: National Commission for Science, Technology and Innovation

Account No.: 1104162547 **Swift Code:** KCBLKENX

Bank: KCB Bank, Kipande House Branch, NAIROBI **Transaction Description:** Research Licence Fee

Non-Kenyans - US Dollar Account

Account Name: National Commission for Science, Technology and Innovation

Account No.: 2904970067 **Swift Code:** CBAFKENX

Bank: NCBA Bank, City Centre Branch, NAIROBI **Transaction Description:** Research Licence Fee

National Commission for Science, Technology and Innovation is ISO 9001:2015 Certified